ORDER

6170.11

THE DATA MULTIPLEXING NETWORK PHASE III DETERMINISTIC TIME DIVISION MULTIPLEXING EQUIPMENT PROJECT IMPLEMENTATION PLAN

SEPTEMBER 4, 1991

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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Initiated By: ANC-140

RECORD OF CHANGES

DIRECTIVE NO. 6170.11

CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE

FOREWORD

This order provides technical guidance and management direction for the orderly implementation of the Deterministic Time Division Multiplexing (DTDM) equipment portion of Phase III of the Data Multiplexing Network (DMN) Program. This order identifies and describes specific requirements, events, tasks and activities to be accomplished, as well as project implementation procedures, organizational and program management responsibilities that are necessary to implement the project. Management responsibility for this program is assigned to the Interfacility Communications Program, ANC-400.

The goal of this order is to provide a uniform approach for all organizations that have a role in conducting activities necessary to implement any portion of this project. The procedures and responsibilities in this order were developed using current agency directives, and the format and content are prepared as specified in FAA-STD-036, Preparation of Project Implementation Plans, and Order 1320.1C, FAA Directives System.

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Program Manager for Interfacility
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CHAPTER 1. GENERAL

1. PURPOSE. This order provides the Project Implementation Plan (PIP) for the DTDM equipment portion of the DMN Phase III and presents overall technical guidance and management direction for the orderly implementation of the DTDM equipment at the respective sites. It identifies activities and schedules required to accomplish this implementation. DMN Phase III is a continuation of the Capital Investment Plan (CIP) Project 5-02, Data Multiplexing. Support and cooperation by other organizations is essential for successful implementation of the DTDM equipment.

2. DISTRIBUTION. This order is distributed at division level to the office of the Program Director for Communications and Aircraft Acquisition, Systems Maintenance, NAS System Engineering, and Air Traffic Plans and Requirements Services, and the Office of Training and Higher Education; to branch level in the FAA Academy and FAA Logistics Center at the Mike Monroney Aeronautical Center; to branch level in the Engineering, Test and Evaluation Service at the FAA Technical Center; to branch level in the regional Airway Facilities and Air Traffic divisions; and a standard distribution to all Airway Facilities sectors, sector field offices, sector field units, and sector field office units and Air Traffic field offices.

3. ACRONYMS AND ABBREVIATIONS. The following abbreviations and acronyms used in this order:

AAF	Associate Administrator for Airway Facilities
AAL	Alaskan Region
ACE	Central Region
ACF	Area Control Facility
ACN	Engineering, Test and Evaluation Service
ACT	FAA Technical Center
ADAS	AWOS Data Acquisition System
AEA	Eastern Region
AF	Airway Facility
AFSS	Automated Flight Service Station
AGL	Great Lakes Region
AHT	Office of Training and Higher Education
ALG	Logistics Service
ANC	Office of the Program Director for Communications and Aircraft Acquisition
ANE	New England Region
ANM	Northwest Mountain Region
ANMS	Automated Network Management System
ANS	NAS Transition & Implementation Service
APML	Associate Program Manager for Logistics

ARSR	Air Route Surveillance Radar
ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal Systems
ASE	NAS System Engineering Service
ASM	Systems Maintenance Service
ASO	Southern Region
ASW	Southwest Region
ASOS	Automated Surface Observing System (Weather)
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
AWOS	Automated Weather Observing System
AWP	Western Pacific Region
BDAT	Beacon Data
BERT	Bit Error Rate Test
BTU	British Thermal Unit
C	Celsius
CAI	Contractor Acceptance Inspection
CAP	Communications Application Processor
CBI	Computer Based Instructions
CD	Common Digitizer
CDRL	Contract Data Requirements List
CFCF	Central Flow Control Center Facility
CFWSU	Central Flow Weather Service Unit
COTS	Commercial-off-the-shelf
CP	Communication Platform
CPU	Central Processing Unit
CSR	Communications Service Request
CSU/DSU	Channel Service Unit/Data Service Unit
DBRITE	Digital Bright Radar Indicator Terminal Equipment
DCX	Data Concentrating Exchange
DLP	Data Link Processor
DMN	Data Multiplexing Network
DTMF	Dual Tone Multiple Frequency
DRR	Deployment Readiness Review
DTDM	Deterministic Time Division Multiplexing
DPA	Delegation of Procurement Authority
DPS	Data Processing System
DT&E	Developmental Test and Evaluation
EIA	Electronic Industries Association
FAA	Federal Aviation Administration
FAC	Facility
FDEP	Flight Data Entry and Printout
FDIO	Flight Data Input/Output
F&E	Facilities and Equipments
FEC	Forward Error Correction
FSAS	Flight Service Automation System
FSDPS	Flight Service Data Processing System
GFE	Government Furnished Equipment
GNAS	General NAS Sector Office

HLI	Hekimian Laboratories Inc.
HSTDM	High Speed Time Division Multiplexer
IDAT	Interfacility Data
ILSP	Integrated Logistics Support Plan
IRD	Interface Requirements Document
ISSAC	Initial Supply Support Allowance Chart
IT&E	Integration Test and Evaluation
JAB	Joint Acceptance Board
JAI	Joint Acceptance Inspection
KVA	KiloVolt Ampere
LDM	Limited Distance Modem
LRU	Line Replaceable Unit
LSA	Logistics Support Analysis
LSAR	Logistics Support Analysis Report
MDS	Master Demarcation System
MDT	Maintenance Data Terminal
MMS	Maintenance Management System
MNP	Microcom Network Protocol
MPS	Maintenance Processor Subsystem
MSD	Modem Sharing Device
NADIN	National Airspace Data Interchange Network
NAILS	National Airspace Integrated Logistics Support
NAS	National Airspace System
NATCC	National Communications Center
NCIU	NEXRAD Communications Interface Unit
NEXRAD	Next Generation Weather Radar
OCD	Operational Capabilities Demonstration
ORD	Operational Readiness Demonstration
OT&E	Operational Test and Evaluation
PIP	Project Implementation Plan
PPL	Provisioning Parts List
PSD	Port Sharing Device
PSTN	Public Switched Telephone Network
PTD	Provisioning Technical Data
PUP	Principal User Processor
RCL	Radio Communications Link
RDAT	Radar Data
RMA	Reliability Maintainability and Availability
RMM	Remote Maintenance Monitoring
RMMS	Remote Maintenance Monitoring System
RMS	Remote Monitoring Subsystem
RMSC	Remote Monitoring Subsystem Concentrator
RPG	Radar Products Generator
SEI	System Engineering and Integration
SCC	Systems Command Center
SMMC	Systems Maintenance Monitor Console
ST&E	Shakedown Test and Evaluation
STDM	Statistical Time Division Multiplexing

SVC	Service
TBS	To Be Supplied
TDWR	Terminal Doppler Weather Radar
TIMS	Transmission Impairment Measuring Set
TM&O	Telecommunications Management and Operations
TMS	Traffic Management System
TOR	Technical Onsite Representative
TPL	Transportation Systems Acquisition Review Council Program List
TRACON	Terminal Radar Approach Control
vac	Voltage Alternating Current
VF	Voice Frequency
WCP	Weather Communications Processor
WMSC	Weather Message Switching Center

4. AUTHORITY TO CHANGE THIS ORDER. The Program Manager for the Interfacility Communications Program, (ANC-400), may issue changes to this order which are necessary to manage and implement the project which do not affect policy, delegate authority, or assign responsibility.

5.-19. RESERVED.

CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS. The DTDM equipment being installed per this order will be utilized to satisfy requirements for data communications of various CIP projects. The DTDM portion of Phase III will allow for the procurement, on a requirements basis, of analog and digital data communications equipment. The project will also increase trunk capacity, add additional facilities, and reconfigure the Phase I/II network to use Radio Communications Link (RCL) transmission facilities.

21. PURPOSE. The purpose of the DTDM equipment procurement is to continue providing the equipment necessary to exploit the opportunities for using data multiplexing technology to satisfy existing data transmission requirements, as well as providing data multiplexing services to CIP projects implemented in 1990 and beyond. New and expanded NAS subsystems potentially supported by the DMN Phase III network include: Automated Weather Observing System (AWOS)/Automated Weather Surface Observing System (ASOS), AWOS Data Acquisition System (ADAS), Digital Bright Radar Indicator Terminal Equipment (DBRITE), Flight Service Automation System (FSAS), Mode S Radar (en route and terminal), Next Generation Weather Radar (NEXRAD), Remote Maintenance Monitoring System (RMMS), Weather Communications Processor (WCP), Traffic Management System (TMS), Maintenance Management System (MMS), Computer Based Instruction (CBI), tail circuits to data switching systems such as NADIN II, and future requirements.

22. HISTORY.

a. Initially each CIP project provided data communications equipment and circuit connectivity for their own data communications requirements. This philosophy resulted in multiple leased lines between facilities and, in many instances, duplicate lines to provide backup for each requirement. The use of dedicated leased lines was expensive and was not an effective utilization of the circuit capacity available. Studies indicated that the use of time division multiplexing technology would enable a number of independent data transmission requirements to be consolidated into a single transmission channel without any adverse impact to data throughput.

b. The DMN project was approved, as part of the CIP, in 1981 to implement data multiplexing technology. The DMN project uses data multiplexing to interconnect several FAA facilities, thereby providing a minimum number of discrete channels for multiple data transmission paths. The project also

provides for network backbone routing, real-time monitoring and control, multiple routing, and automatic back-up systems.

c. The DMN Phase I network was utilized to connect 20 Air Route Traffic Control Centers (ARTCC), 130 Air Route Surveillance Radars (ARSR), the National Communications Center (NATCC), the FAA Technical Center (ACT) and the Central Flow Control Center Facility (CFCF) at the Systems Command Center (SCC) in National headquarters. The Phase I network principally carried long-range radar data (RDAT), interfacility data (IDAT) ARTCC-to-ARTCC, Traffic Management System (TMS) data and Flight Service Data Processing System (FSDPS) Service A data.

d. During DMN Phase II, 420 terminal airport facilities were added to the network and transmission channels were provided for IDAT from ARTCC to Automated Radar Terminal Systems (ARTS) at Terminal Radar Approach Control (TRACON) Facilities; Flight Data Input/Output (FDIO) data; CBI data and RMMS data.

e. DMN Phase I/II was established through a 5-year contract for commercial-off-the-shelf (COTS) equipment plus related implementation and maintenance support services. Phase I/II installation was completed in April 1988. An initial investment of $25M has resulted in an annual savings in lease line costs and cost avoidance of approximately $13M. Recent studies indicate that similar savings can be expected for DMN Phase III.

f. The DMN Phase III has been approved as a Transportation System Acquisition Review Council Program List (TPL) acquisition. FAA authorization of funds to proceed with the procurement and implementation of the DMN Phase III was approved on December 29, 1988.

g. The functional specification for DMN Phase III, DTDM equipment (FAA-E-2786) has been completed. The contract was awarded to CODEX Corporation on April 9, 1990.

23. DTDM ACQUISITION STRATEGY. Key aspects in the acquisition of the DMN Phase III, DTDM equipment, are as follows:

a. A negotiated fixed-price indefinite-delivery, requirements contract to procure DTDM equipment was awarded to Codex Corporation in April 1990. In order to provide flexibility in meeting new NAS data communications requirements through the 1990's (the equipment life cycle will be 10 years), the contract was written to cover an 8-year equipment ordering period and a 10-year installation and maintenance period. This

was accomplished by awarding an initial 3-year contract with up to seven options of one year each. No orders for equipment will be placed past the fifth option year. Maintenance will be accomplished at the equipment site, at the vendor's maintenance depot or a combination of these options.

b. The DMN Phase III DTDM procurement consists primarily of COTS equipment with the exception of the digital A/B switch and the clock box.

c. Equipment and services provided by the DTDM Contract are as follows:

(1) Equipment.

(a) Modems (Asynchronous)
Type IA-Dial modem: 300, 1200, and 2400 bps
Type IB-Dial modem: 4800 and 9600 bps
Type II-Leased Line modem: 2400 bps

(b) Multiplexing Modems (Synchronous)
Type III-Leased line modem: 4.8 Kbps
Type IV-Leased line modem: 9.6 Kbps
Type V-Leased line modem: 14.4 Kbps
Type VI-Leased line modem: 19.2 Kbps

(c) Automatic Network Management System (ANMS)

!! (d) Clock Box

(e) Channel Service Unit/Data Service Unit (CSU/DSU)

(f) High Speed Time Division Multiplexer (HSTDM)

(g) Limited Distance Modems (LDM)

(2) Ancillary Equipment.

(a) Interface adapters.
(b) Port sharing devices (PSD).
(c) Modem sharing devices (MSD).
(d) Tail circuit synchronizers.
(e) "Hot" standby switches.

(f) Modem substitution switches.
(g) Digital and analog patch panels.
!! (h) Digital A/B switches.
(i) Equipment cabinets.
(j) Cables.

!! These equipment types are non-COTS.

(3) Installation. Contractor provided installation and integration of the above network equipment.

(4) Maintenance Support.

(a) On-call maintenance for selected equipment.

(b) Depot repair at contractor facility for removable components.

(c) Technical assistance.

(d) Procurement of spare parts.

(e) Life-cycle repair parts and service data for items no longer supported by the contractor.

(5) Training. Codex Corporation will provide the following training courses for the FAA program/project managers and operator/maintenance technicians.

(a) Operations and maintenance course for modems, multiplexers, and limited distance modems.

(b) Operations and maintenance course for ancillary equipment and clock box.

(c) Operations and maintenance course for DSU, CSU and HSTDM.

(d) Operations course for the ANMS.

(e) Overview of the DMN.

(6) Network Engineering. Contractor provided network engineering services.

d. Test Equipment. The following DMN Phase I/II test equipment is already available in the field and will be utilized for the DMN Phase III.

(1) Transmission Line Impairment Test Set. The Hekimian Laboratories Inc. (HLI) model 3701 and 3901 test sets are presently in place at ARTCC's.

(2) Bit Error Rate Test (BERT) Equipment. The MAXICHECK and HP-4925B BERT equipment are being used at ARTCC's to provide DTE-to-modem testing and remote digital loopback testing for synchronous and asynchronous data. Additional test equipment will be added to the ARTCC's for V.35 testing with the HSTDM and CSU/DSU. HP-4925B BERT equipment will be provided to the GNAS offices.

(3) Protocol Analyzer. The HP-1640B is used to analyze the Interfacility Data (IDAT) and Flight Data Entry and Printout (FDEP) protocols and also can be used as a BERT tester. This test equipment will be phased out as new state-of-the-art protocol analyzers are acquired. All new test equipment will be supported by the FAA Logistics Center.

24. Transition Strategy. With the contract award to CODEX Corporation, the DMN Phase I/II DTDM equipment, provided by Paradyne, will be replaced with CODEX equipment. At the completion of the replacement of the Paradyne equipment with Codex Corporation equipment or the end of the base period of the contract, whichever occurs first, the overall management of the DTDM project will transition from the Interfacility Communications Program Manager, (ANC-400), to the Telecommunications Management and Operations Division, (ASM-300). Disposition of Paradyne equipment will be determined at that time.

25.-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION. The DMN Phase III project will expand the DTDM network to meet the increased demand for point-to-point and multipoint data communications requirements with dedicated bandwidth. The DTDM network will provide connectivity, and end-to-end transport of data. Automatic fallback routing will be provided for time critical data (e.g., RDAT and IDAT). The DTDM network will allow connectivity for tail circuits by accessing one of the ports on a DTDM modem. Network monitoring and control will be provided using the ANMS connected to the DTDM modems located in the ARTCC's. The developmental equipment will be utilized in the DTDM network to provide for special requirements. The clock box will be used to provide clocking for RDAT and the digital A/B switch will allow for automatic switching of the data transmission paths. The clock box and the digital A/B switch will have the capability of ANMS control. Figure 3-1 provides a functional diagram of the DMN network at a typical ARTCC. Figures 3-2 and 3-3 provide the functional diagrams of the use of the clock box and the digital A/B switch.

a. Data Transfer. The DTDM equipment will provide for fast, accurate, and reliable transfer of data over the network in the following manner:

(1) Assigned Bandwidth. The DTDM modems will allow the allocation of a specific bandwidth in an individually assigned channel (port).

(2) Error Correction. The DTDM modems will provide error detection and correction. They will provide Microcom Networking Protocol (MNP), Trellis Coded Modulation or some form of forward error correction (FEC).

(3) Fallback Routing. Selected ports on the DTDM modem will be equipped with a digital A/B (fallback) switch which will automatically switch data from one circuit to another when a circuit/equipment failure occurs.

(4) Radar Signal Clocking. The clock box will provide clocking signals for radar data at the common digitizer (CD) and modems transmitting RDAT.

(5) Modem Substitution. A modem substitution switch will connect multiple modem digital and analog interfaces in a matrix configuration. The digital and analog interfaces of the operational modems will be monitored by the modem substitution switch. When failures are detected, the substitution switch

FIGURE 3-1. TYPICAL ARTCC FUNCTIONAL DIAGRAM

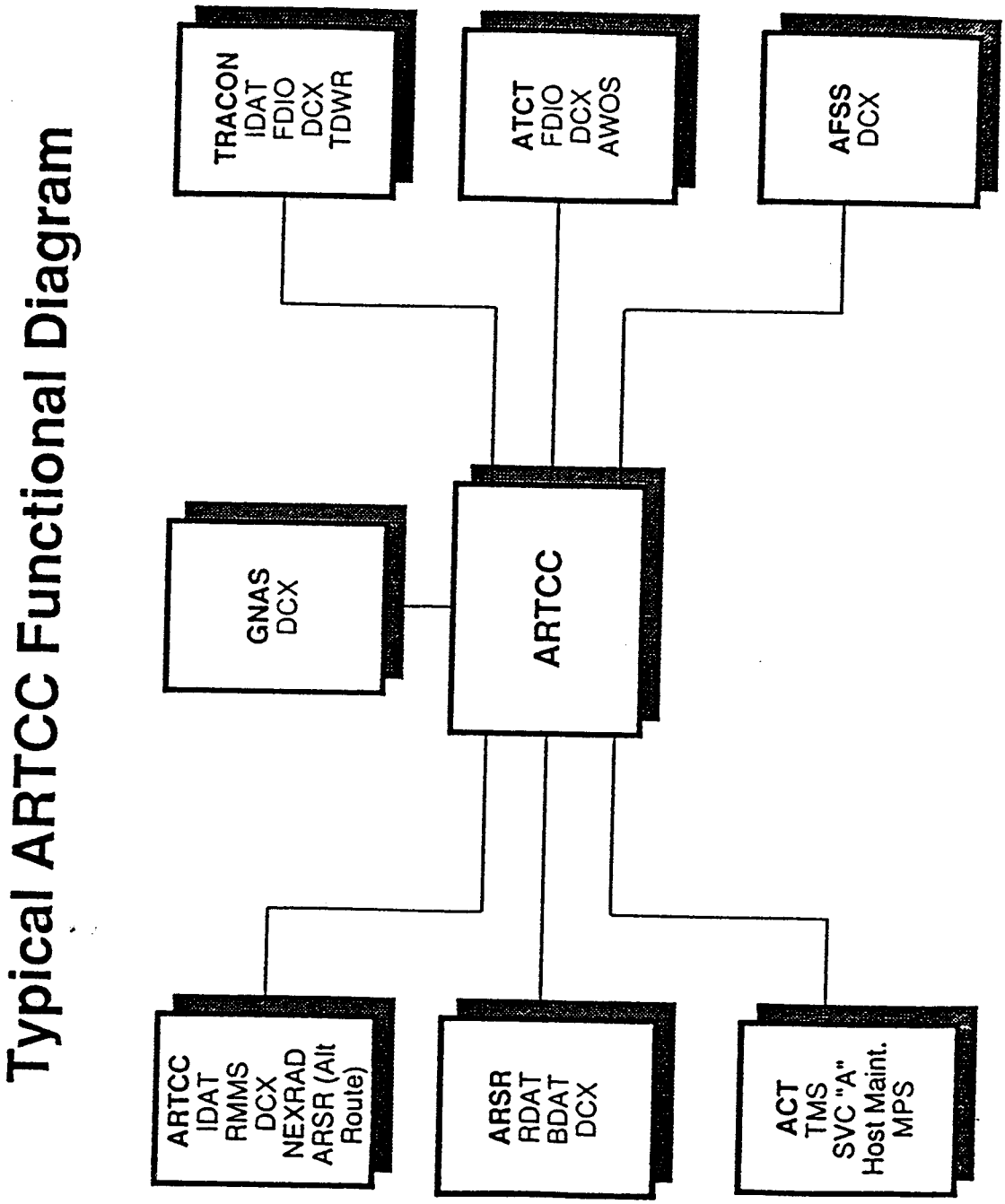


FIGURE 3-2. CLOCK BOX INTERFACE

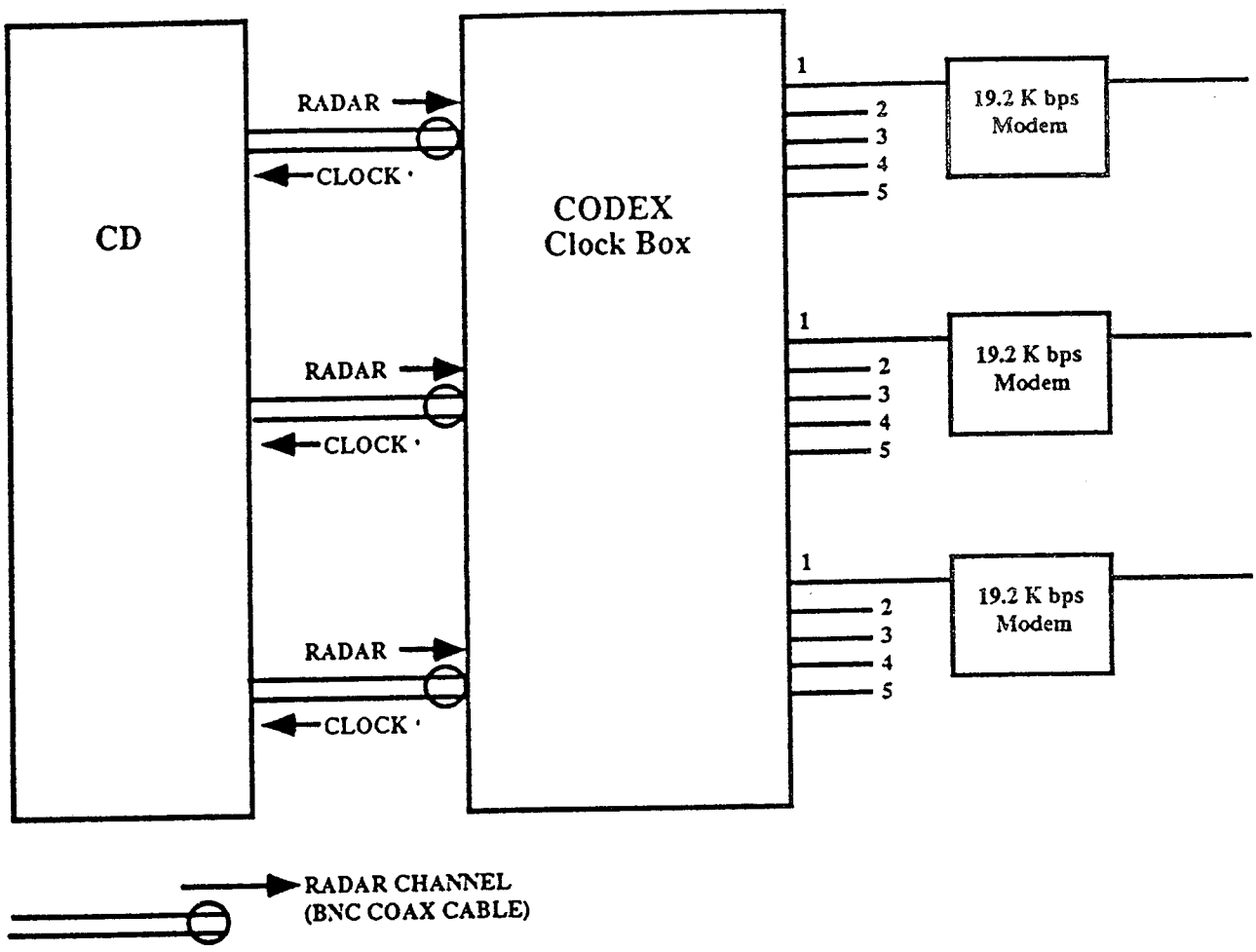
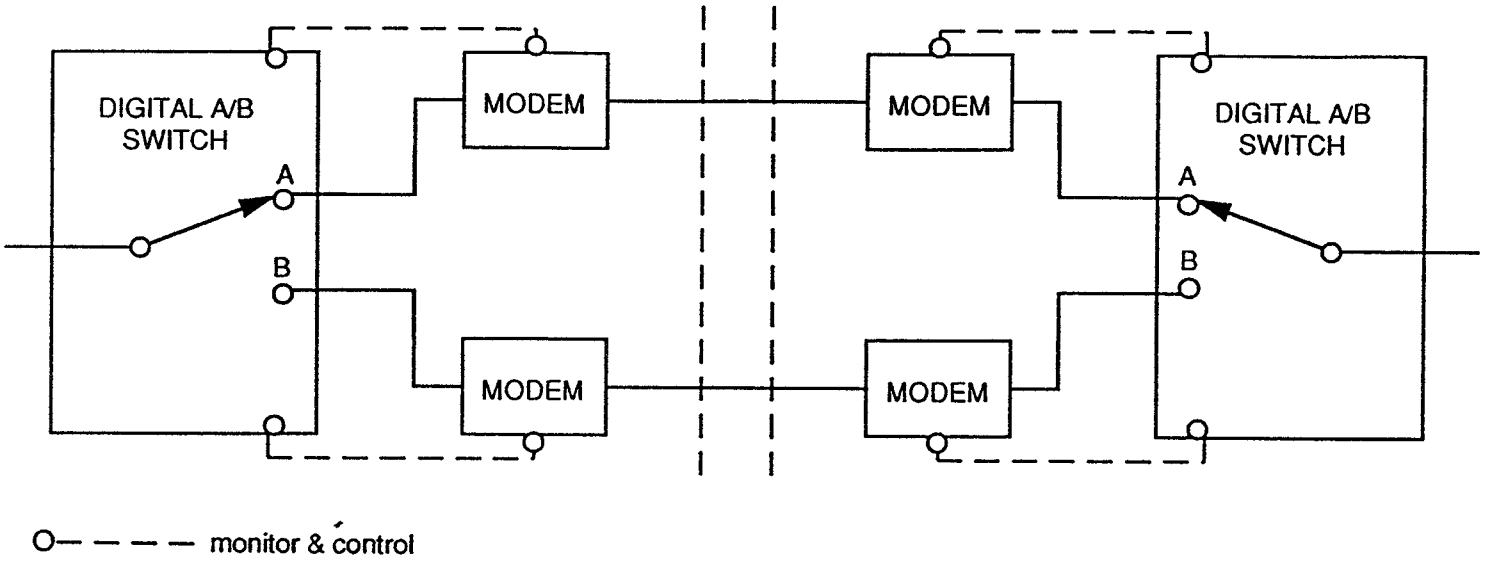


FIGURE 3-3. DIGITAL A/B SWITCH



will automatically change both analog and digital signal paths to one of the spare modems.

(6) Hot Standby Substitution. Selected modems will be connected to a hot standby switch. The hot standby switch will interface the digital and analog interface of two modems and allow for immediate 1 for 1 replacement of the on-line modem.

(7) Dial Backup. DTDM modems may be purchased with one of three possible dial backup methods as follows:

(a) Automatic Dial Backup. When the Type V or VI master modem recognizes a leased line failure, it will automatically establish connectivity via the public switched telephone network (PSTN) by dialing a preprogrammed telephone access number for the modem at the remote site.

(b) Semiautomatic Dial Backup. When the ANMS recognizes a leased line failure, the ANMS operator can activate the dial backup operation of the Type II - VI modem from the ANMS. When activated, the dial backup will establish connectivity via the PSTN by dialing a preprogrammed telephone access number for the modem at the remote site.

(c) Manual Dial Backup. When the operator recognizes a leased line failure, either on the modem or the ANMS, he/she can initiate dial backup manually from the front panel of the Type II - VI master modem to establish connectivity via the PSTN by the local modem dialing the access number for the modem at the remote site.

b. Network Access. The DTDM equipment will allow users to access the network using either RS-232 C/D or EIA-530 digital interfaces. Digital interfaces will comply with IRD NAS-IR-44010001, Transmission Equipment: Digital Interface Requirement.

c. Network Management and Control. The ANMS will provide network management and control of the DMN Phase III DTDM network as follows:

(1) Network Management. The ANMS will provide network management through the use of:

(a) Network configuration data bases.

(b) Trouble ticket data bases.

(c) Storage of all alarm conditions.

(d) Diagnostic testing.

(e) Trend analysis of various alarm conditions.

(f) Report generation.

(2) Network Monitoring. The ANMS will provide continuous monitoring of each line and all major components of the DMN and will not depend on network usage to detect a problem.

(3) Network Control. The ANMS will control the operation of network components such as Limited Distance Modems (LDM), modems/multiplexers, CSU/DSU's, digital A/B switch, modem substitution switch, "hot" standby switch and clock box.

d. Site Equipment Sparing. In order to provide continuous data transmission service, the FAA provides spare pieces of equipment at various locations. The paragraphs which follow discuss the sparing used at various locations.

SPARING RATIO

	ARTCC	REMOTE FACILITY
Modem Type I	1:10 (Note 1)	Note 1
Modem Types II-VI	1:10 (Note 1)	Note 1
HSTDM	1:5 (Note 1)	Note 1
CSU/DSU	1:10 (Note 1)	Note 1
A/B Switch (Stand alone)	1:10 (Note 1)	Note 1
A/B Switch (Nested)	1:10 (Note 1)	Note 1
A/B Switch (Card Cage)	Note 1	Note 1
MSD	1:10 (Note 1)	Note 1
PSD	1:10 (Note 1)	Note 1
ANMS	Note 2	N/A
ANMS Terminals	Note 2	N/A
ANMS Printers	Note 2	N/A
Modem Substitution Switch	N/A	Note 3
Hot Standby Switch	N/A	Note 3
Clock Box	N/A	Note 3

NOTE 1: As a minimum, one spare will be provided for each equipment type. The program office, in consultation with the regional associate project manager, will determine the quantity and location of spares prior to submitting delivery orders.

NOTE 2: CODEX Corporation will provide onsite maintenance for this equipment when required. Codex Corporation personnel will

be on call 24 hours per day, 7 days per week, with a 2-hour response time. The FAA will not maintain spare parts for this equipment at the ARTCC.

NOTE 3: Spares for remote sites for this equipment will be maintained at the FAA Logistics Center only and will be ordered on an "As Required" priority basis.

31. PHYSICAL DESCRIPTION. Refer to figure 3-4 for the physical description of the various items of equipment.

32. SYSTEM REQUIREMENTS. System requirements will continue to increase as new CIP project data communications requirements are satisfied using the DTDM equipment on the DMN.

a. Electrical Power. The electrical power requirements for each equipment item is displayed in figure 3-4. The electrical power requirements for the DTDM sites are as follows:

(1) ARTCC Requirements. The electrical requirements for an ARTCC may be determined by utilizing the equipment rack layout information presented in appendix 3, the floor plan information presented in appendix 4, and the equipment information presented in figure 3-4.

(a) Critical Power. Critical power requirements may be determined by using the information in appendix 3.

(b) Essential Power. Essential power requirements may be determined by using the information in appendix 3.

(2) Other Locations. Power requirements for other locations can be determined by referencing figure 3-4 for the equipment to be installed at the location.

b. Space. The space requirements for DTDM equipment are as follows:

(1) ARTCC Requirements. The DTDM space requirements for the ARTCC will be 924 sq ft, maximum. Three representative ARTCC floor plans are displayed in appendix 4.

(2) Other Locations. Space requirements for other locations can be determined by referencing appendix 3 and/or figure 3-4 for the equipment to be installed at the location.

c. Environmental.

FIGURE 3-4. PHYSICAL DESCRIPTION of EQUIPMENTS

EQUIPMENT DESCRIPTION	WIDTH (IN)	DEPTH (IN)	HEIGHT (IN)	UNIT SPACE (CUIN)	UNIT WEIGHT (LBS)	UNIT HEAT GEN (BTU/H)	UNIT VOLTAGE 60 hz	UNIT POWER (WATTS)
ANALOG PATCH PANEL	19.00	9.00	1.75	306.09	6.75	0.00	---	---
DIGITAL PATCH PANEL 232/V35	19.00	6.63	5.25	661.34	0.00	0.00	---	---
DSU/CSU 2150/2160	12.00	16.00	7.00	1344.00	4.50	33.00	120	10
DSU/CSU 3500	6.60	9.60	2.30	145.73	2.50	0.00	120	10
MODEM SHARING DEVICE	8.50	16.00	3.00	408.00	4.40	33.00	120	10
PC (2) AND PRINTER (1)	N/A	N/A	N/A	N/A	0.00	0.00	---	---
TYPE 1A MODEM (2440)	7.00	9.60	2.25	151.20	2.60	26.00	120	8
TYPE 1B MODEM (2264)	8.50	16.00	3.00	408.00	7.00	116.00	120	35
TYPE II MODEM 2510	8.50	16.00	3.00	408.00	6.00	33.00	120	12
TYPR III MODEM (2620)	17.00	16.25	3.50	966.88	20.00	112.00	120	45
TYPE IV MODEM (2640)	17.00	16.25	3.50	966.88	20.00	112.00	120	45
TYPE V MODEM (2660)	17.00	16.25	3.50	966.88	20.00	112.00	120	45
TYPE VI MODEM (3680)	17.00	6.75	3.50	401.63	20.00	165.00	120	80
ANMS CPU	21.00	17.00	7.00	2499.00	52.00	157.00	120	478
ANMS MONITOR	14.10	15.20	16.20	3471.98	26.00	248.00	120	75
EQUIPMENT RACK	N/A	N/A	N/A	N/A	0.00	0.00	---	---
INTERFACE ADAPTERS	6.00	8.00	2.00	96.00	0.00	0.00	---	---
TAIL CIRCUIT SYNCHRONIZER	4.12	2.25	0.75	6.95	0.00	0.00	---	---
TYPE IB/ II NEST	19.00	21.50	10.50	4289.25	38.00	1238.00	120	375
TYPE III/IV/V NEST	19.00	18.00	11.22	3837.24	89.00	1238.00	120	375
MODEM SUBSTITUTION SWITCH - 2	19.00	10.00	8.75	1662.50	0.00	0.00	120	TBD
MODEM SUBSTITUTION SWITCH - 3	19.00	10.00	15.75	2992.50	0.00	0.00	120	TBD
MODEM SUBSTITUTION SWITCH - 4	19.00	10.00	15.75	2992.50	0.00	0.00	120	TBD
DIGITAL A/B SWITCH REMOTE PNL	19.00	0.00	3.50	66.50	0.00	0.00	120	TBD
DIGITAL A/B SWITCH NEST	19.00	8.00	7.00	1064.00	0.00	0.00	120	TBD
CLOCK BOX	N/A	N/A	N/A	N/A	0.00	0.00	120	TBD
INTERFACE CONVERTER RS232/530	N/A	N/A	N/A	N/A	0.00	0.00	---	---
LIMITED DISTANCE MODEM	6.60	9.45	1.10	68.61	1.30	33.00	120	10
DIGITAL BRIDGE (2185)	8.54	16.00	2.71	N/A	5.00	33.00	120	10
COMMUNICATION PLATFORM 3600	17.25	17.50	3.50	1056.56	17.50	2640.00	120	80

(1) Ambient Temperature. The DTDM equipment will operate in an ambient temperature from a low of 0 degrees C (Celsius) up to a temperature of 50 degrees C.

(2) Relative Humidity.

(a) Attended Facilities. The humidity must be maintained between a low of 10 percent and a high of 80 percent.

(b) Unattended Facilities. The humidity must be maintained between a low of 5 percent and a high of 90 percent.

(3) Heat Dissipation. Temperature control must be provided which allows for dissipation of the heat generated by the DTDM equipment. The amount of heat generated by the DTDM equipment in end-state, shown in appendix 3, is as follows:

(a) ARTCC Locations. The heat requirements for an ARTCC may be determined by utilizing the equipment rack layout information presented in appendix 3, the floor plan information presented in appendix 4, and the equipment information presented in figure 3-4.

(b) Other Locations. The heat generated by equipment at other locations can be determined by reference to figure 3-6 for the equipment to be installed at the location.

33. INTERFACES. The program connectivity presented in subparagraphs a and b will utilize the DMN for transmission media and will interface as described.

a. Communications Channel Interfaces. The Communication Channel Interfaces of the DMN, specifically the DTDM, are dependent upon the installation requirements and schedules of on going and future NAS planned projects as well as the communications system assignments made by the Telecommunications Management and Operations Division (TM&O), ASM-300.

The NAS planned projects are then promulgated in the Future National Airspace System Telecommunications Plan (FUCHSIA BOOK). Once these requirements are defined in the FUCHSIA BOOK they are further refined and then will appear in the CIP as the project nears its starting point and funding becomes available. As this process evolves ASM-300 makes the final determination which resource (DMN, RCL, ect.)

will be utilized to satisfy the requirement. When this determination is made the DMN requirements are then identified, equipment is ordered, and installation schedules are developed.

b. Physical Interfaces.

(1) Type I - VI Modems. The digital interfaces of all modems will conform to RS-232 C or D. The interface will be convertible between RS-232 and EIA-530.

(2) ANMS. The ANMS will provide an external port capability to accommodate the RMMS requirements.

(3) CSU/DSU. The interfaces for the CSU/DSU will conform to CCITT V.35 and RS-232 C or D depending on speed. The interfaces will be convertible to EIA-530.

(4) HSTDM. The input interface to the HSTDM will conform to RS-232 C or D and will be convertible to EIA-530. The output interfaces will conform to CCITT V.35.

(5) LDM. The digital interfaces for the LDM will conform to RS-232 C or D.

(6) Clock Box. The clock box will accept three pairs of coaxial cables with Bayonet Neill Concelma (BNC) type interface cables from the CD. Each cable pair contains one cable for transmitting radar data from the CD and a second cable for transmitting timing data from the clock box to the CD. The clock box to modem interface will be RS-232 C or D. There will be five interfaces per radar channel for a total of 15 interface connectors per clock box.

(7) Ancillary Equipment. All ancillary equipment interfaces will be RS-232 C or D and convertible to EIA-530.

c. Applicable Interface Requirements Documents (IRD).

(1) Area Control Facility to Data Multiplexing Network, NAS-IR-61004303.

(2) Transmission Equipment: Digital Interface, NAS-IR-44010001.

(3) Transmission Equipment: Analog Interface, NAS-IR-44010002.

34.-39. RESERVED.

CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. PROJECT SCHEDULES AND GENERAL STATUS. The project schedule for the procurement process has been established. The installation schedule is more difficult to determine since it is totally dependent on CIP and the Telecommunications Management and Operations Division (TM&O), ASM-300, and projects which will utilize the DTDM equipment for data communications.

41. MILESTONE SCHEDULE SUMMARY. The milestone schedules for the project are presented in subparagraph a.

a. DTDM equipment procurement and testing:

(1) Milestone	Date
Procurement Request	08/30/88
Delegation of Procurement Authority (DPA) Granted	08/31/88
TPL Decision Memorandum Approved	12/29/88
Solicitation Issued	05/05/89
Proposals Received	08/22/89
Technical Proposal Evaluation Completed	09/15/89
Operational Capabilities Demonstration (OCD) Completed	12/08/89
Cost Proposal Evaluation Completed	03/02/90
Best and Finals Received	03/13/90
Contract Award	04/09/90

(2) COTS Schedule

Operational Test and Evaluation (OT&E) Completed	06/30/91
Integration Test and Evaluation (IT&E) Completed	06/30/91
Shakedown Test and Evaluation (ST&E) Completed	07/31/91
First Site (Partial) Joint Acceptance Inspection (JAI) Completed	12/18/91

(3) Non-COTS Schedule

Developmental Test and Evaluation (DT&E) Completed	04/13/91
Production Acceptance Test and Evaluation (PAT&E) Completed	06/14/91
OT&E Completed	06/29/91

IT&E Completed	06/29/91
ST&E Completed	07/29/91
First Site (Partial) JAI Completed	12/18/91

b. The DTDM COTS equipment installation is dependent upon the schedules of other CIP projects that will require the use of the DTDM equipment. The installation of the non-COTS equipment is also dependent on the production schedules of the equipment.

42. INTERDEPENDENCIES AND SEQUENCE. The DTDM equipment portion of the DMN Phase III project is dependent on the installation schedules of other CIP projects as well as the communications system assignments made by the Telecommunications Management and Operations Division (TM&O), ASM-300. ASM-300 will make the determination as to which resource (DMN, RCL, leased services, National Airspace Data Interchange Network (NADIN), ect.) will be utilized to fill a data communications requirement generated by a CIP project. Installation schedules can only be developed after communications requirements have been assigned to the DMN project.

43. DTDM PROJECT IMPLEMENTATION SCHEDULE. Refer to appendix 2 for the DTDM Project Implementation Schedule.

44.-49. RESERVED.

CHAPTER 5. PROJECT MANAGEMENT

50. PROJECT MANAGEMENT, GENERAL. The project management organization at the FAA headquarters and the regions that will be responsible for the successful implementation of the DTDM equipment are presented in the following paragraphs. Their respective areas of responsibilities in the implementation are described.

a. FAA Headquarters Project Management.

(1) Program Manager for Interfacility Communications (ANC-400). ANC-400 has responsibility for the management of the Interfacility Communications Program and will provide the following:

(a) Provide technical guidance and direction to the Phase III contractor within the scope of the contract.

(b) Perform systems engineering and analysis.

(c) Ensure adherence to CIP requirements.

(d) Maintain Phase III summary milestone schedule.

(e) Develop and maintain the project implementation plan.

(f) Monitor CODEX Corporation factory tests.

(g) Monitor site acceptance tests.

(h) Serve as a member of the Deployment Readiness Review (DRR) Team.

(i) Participate in the contractor acceptance inspection (CAI).

(j) Support ACN-200 in FAA integration testing (as required).

(k) Support Navigational Aids/Communications Engineering Branch, ASM-640, in FAA shakedown testing.

(l) Participate in the final JAI.

(m) Communicate program information and status.

(2) DMN Project Leader (ANC-140). A member of the Interfacility Communications Program, (ANC-400), who is designated the DMN Project Leader. The DMN Project Leader, as designated by ANC-400, is responsible for developing, coordinating, and implementing the Phase III project. The implementation responsibilities of the DMN Project Leader are to ensure that the DTDM equipment is ready for integration into the NAS, and that the FAA will be ready to receive, operate, and provide life-cycle support to the DTDM equipment when deployed.

(3) Associate Program Manager for Logistics (APML) (ANS-420). The APML will ensure that all applicable NAILS requirements are identified, managed, acquired, and integrated into the DTDM acquisition in a manner that provides for total life-cycle support.

(4) Contracting Officer (ALG-330). The contracting officer will convert the program requirements into contractual documents and perform contract management activities concerned with assuring that the terms of the contract are met. The contracting officer will be the only person authorized to make changes that will affect prices, deliverables, and/or schedules.

(5) Telecommunications Management and Operations Division (TM&O)(ASM-300). ASM-300 has the responsibility for management and operations of FAA telecommunications.

(a) DMN Manager (ASM-310). A member of the Telecommunications Operations and Administration Branch, (ASM-310), has been designated the DMN Manager. The DMN Manager is responsible for management, operation, administration, and maintenance of the DMN.

(b) DMN Engineer (ASM-320). A member of the ASM-320 staff has been designated as the DMN engineer. The DMN Engineer has the overall management responsibility for planning, circuit engineering, and configuration control of communication requirements received from NAS project managers and regional personnel. Those requirements to be satisfied using the DMN will be coordinated with the DMN Manager.

b. Lead Region Engineer (ASW-400). An engineer from the Southwest Region NAS Coordination and Implementation Staff, ASW-482.2, has been designated Lead Region Engineer. The responsibilities of the Lead Region Engineer are to support the following activities in the DTDM equipment portion of the DMN project:

(1) Operational testing.

(2) Shakedown testing.

(3) Installation engineering.

c. Regional Project Management. The FAA regions have each designated a regional DMN Assistant Program Manager who is responsible for the planning and implementation of all phases of the DMN within the region. Responsibilities of the Assistant Program Manager are as follows:

(1) Interface with the ANC-140 DMN Project Leader on all Phase III implementation activities including the following major items:

(a) Implementation planning.

(b) Project funding.

(c) Scheduling.

(d) Testing.

(e) Training.

(f) Maintenance.

(g) Integrated logistics support.

(2) Coordinate with the regional divisions and facilities in matters pertaining to the DMN and be the focal point for:

(a) Site configuration management.

(b) Site preparation support.

(c) Site survey support.

(d) DTDM equipment installation support.

(e) Site acceptance testing support.

(f) Documentation of regional network(s).

(3) Interface with the Airway Facilities sectors on all DTDM equipment implementation activities including the following major items:

(a) Hardware delivery.

(b) Installation.

(c) Integration and testing.

(d) System shakedown.

(e) Operational readiness demonstration (ORD).

(f) Equipment relocation.

(g) JAI.

(4) Provide implementation direction to technical on-site representatives (TOR).

(5) Interface with regional TM&O DMN data base manager.

d. ARTCC and Other Facilities (FAC) Project Management. The TOR at each ARTCC or FAC will be assigned by the region and will have site responsibility for the contractual management of the DTDM equipment installation within the affected site. The TOR will be the ALG-330 contracting officer's representative to ensure that the CODEX Corporation performs in accordance with the terms of the contract and will be responsible for all FAA coordination with the contractor at the site. The TOR will attend the CODEX Corporation training courses to the extent possible. The duties of the TOR will be to:

(1) Ensure that site preparation activities are complete and acceptable prior to the arrival of the DTDM equipment.

(2) Assist CODEX Corporation in conducting any required site surveys.

(3) Coordinate with the site manager the scheduling of site personnel necessary to support or monitor the installation of DTDM equipment and to coordinate site approval of any installation work to be performed after normal working hours.

(4) Report any problems encountered during the installation and resolve those problems with the help of the regional APM or the DMN Project Leader (ANC-140), as required.

(5) Ensure that all DTDM hardware has been properly installed.

(6) Ensure that all required installation, integration, and acceptance testing have been completed satisfactorily.

(7) Sign-off on the delivery and successful site installation of the DTDM equipment. Final acceptance, by the Government, for the DTDM equipment will be accomplished only after the equipment has completed 30 days of trouble-free operation as required by the contract.

(8) Provide the site manager with periodic status and progress reports on the installation and checkout of the DTDM equipment.

(9) Develop and maintain site specific implementation schedules by coordinating with the site manager.

(10) Coordinate the JAI in accordance with Order 6030.45, Facility Reference Data File.

e. Regional TM&O Responsibilities. The regional TM&O representatives will maintain data bases for the communications networks and provide updates to the headquarters TM&O office.

51. PROJECT CONTACTS. Refer to appendix 2 for a listing of the project management personnel designated as contacts for their respective organizations in the FAA headquarters and regions.

52. PROJECT COORDINATION. In addition to the project management organization described in paragraph 50, the coordination and active support of a number of other FAA organizations will be of great importance to the successful implementation of the DTDM equipment.

a. FAA Headquarters. Listed below are the various organizations which are required to support the DTDM during equipment implementation.

ASE-600	Configuration Management and Engineering Support
ALG-100	Policy and Plans
ALG-200	NAS Support
ALG-400	Industrial Division
ASM-200	Maintenance Operations
AHT-400	Airway Facilities Training Program

b. FAA Technical Center. ACN-200 will serve as the lead for FAA integration testing and development of a Master Test Plan.

(1) Communications System Branch, ACN-260.

(a) Develop FAA OT&E/integration test plans and conduct OT&E/integration testing.

(b) Provide technical support to ANC-400 throughout the DTDM equipment implementation.

(c) Monitor CODEX Corporation factory and site acceptance testing in coordination with ANC-400.

(d) Support ASM-640 in shakedown testing.

(e) Develop the DMN Phase III Master Test Plan in coordination with ANC-400 and ASM-640.

(f) Coordinate testing with CODEX Corporation, ASM-640 and ANC-140.

c. Mike Monroney Aeronautical Center. The FAA Logistics Center and FAA Academy will support the DTDM equipment implementation as follows:

(1) FAA Logistics Center (AAC-400).

(a) Provide logistics support service and planning and accomplish cataloging and provisioning for DTDM equipment.

(b) Conduct a provisioning conference.

(c) Participate in the development of logistics policies and plans for support of the DTDM equipment.

(d) Plan activities for the transition of the DTDM equipment into the logistics inventory.

(e) Provide equipment exchange and coordinate repair support for the DTDM equipment after deployment.

(2) FAA Academy (AAC-900).

(a) Monitor CODEX Corporation development of the DTDM equipment training programs.

(b) Monitor training conducted by CODEX Corporation.

(c) Develop FAA training programs for the operation and maintenance of the DTDM equipment.

d. Navigational Aids/Communications Engineering Branch, ASM-640.

(1) Develop shakedown test plan and conduct shakedown test following Government acceptance of the DTDM equipment.

(2) Provide second level engineering support of the DTDM equipment restoration.

(3) Provide configuration management after Government acceptance of the DTDM equipment.

e. Technical Standards and Contract Maintenance, ASM-120. ASM-120 will serve as the lead for FAA Contract Maintenance and will:

(1) Develop, jointly with ANC-140, an order which outlines the procedures for utilizing maintenance provisions established in the DTDM Contract for all equipment.

(2) Provide contract maintenance management support to ANC-400 throughout the DTDM Contract and option years.

f. Quality Assurance Group, ALG-420. ALG-420 is responsible for ensuring compliance with quality assurance provisions of the contract.

g. Operations Program, ASM-260. ASM-260 is responsible for establishing required training quotas and providing funding for all out-of-agency training.

h. Operations Programs, ASM-610. ASM-610 is responsible for providing second level maintenance support for DTDM equipment.

53. PROJECT RESPONSIBILITY MATRIX. The matrix presented in figure 5-1 shows the organizational responsibilities, and significant functions to be performed during the DTDM equipment implementation.

54. PROJECT LEADER COMMUNICATIONS. The DMN Program Office will manage the project using the communications means which follow:

a. National Datamux Conferences. The program office will host a National Datamux Conference after contract award and then on a semiannual basis. Personnel who may attend the conference are the program office, other headquarters offices, Lead Region Engineering Office, regional associate program managers, site TOR's, and other personnel as may be required to discuss specific topics. This conference will address both DTDM and Statistical Time Division Multiplexer (STDM) issues.

b. FAA Mail. The project office will use the FAA mail system, an electronic mail system, for project use. There is a requirement for the project leader to receive information from the associate program managers and TOR's as well as provide them information on a timely basis for coordinating equipment deliveries and installation. This electronic mail system will be utilized for DTDM issues.

55. IMPLEMENTATION STAFFING. ASM-260 is responsible for providing staffing standards, however, there are no unique or peculiar staffing requirements associated with the DTDM equipment portion of the DMN project. Organizations with assigned responsibilities are expected to accomplish their tasks with existing resources. CODEX Corporation will provide maintenance for the life-cycle of the equipment.

56. PLANNING AND REPORTS. The following plans and reports will be required during the acquisition, testing, and implementation phases of the DTDM equipment.

a. Contractor Documentation. CODEX Corporation will submit the following Contract Data Requirements Lists (CDRL) items as well as others in accordance with the final negotiated schedule and distribution:

(1) Contract Management Plan.

(2) Conference agendas.

(3) Conference minutes.

(4) Configuration Management Plan.

(5) Contractor Master Test Plan.

(6) Installation and Integration Plan.

(7) Site Acceptance Test Plan.

(8) Site Acceptance Test Results Report.

FIGURE 5-1.
PROJECT MANAGEMENT IMPLEMENTATION RESPONSIBILITY MATRIX

Activities		ANC-400	ANC-140	ANS-420	ALG-330	ALG-420	ASM-310	ASM-320	ASM-120	ASM-260	ASM-610	ASM-640	ACN-260	AAC-400	AAC-900	Regional F&E Mgr.	Regional TM&O Mgr	Lead Region (ASW-400)	AF Sector	TOR (Site)	Contractor
Project Management	Planning	●	●				●	●								●		●			
	Scheduling		●					●								●					
	Contract		●		●																
	Funding	●																			
Configuration Management	Network							●									●				
	Equipment		●									●					●				●
Testing	Factory					●							●								●
	Development		●										●					●			●
	OT&E		●										●					●			
	Integration		●										●			●		●	●		
	Shakedown											●						●	●		
Acceptance Testing	Contractor		●			●															●
	Joint		●													●			●	●	
Installation			●													●			●	●	●
Site Preparation			●													●			●	●	
Training										●					●						●
Maintenance	1st Level Support																		●		
	2nd Level Support										●										●
	Funding On-Call		●						●												
	Funding Depot		●											●							
	DMN Handbook		●								●	●									●
Quality Assurance						●															
Network Engineering								●									●	●			
Network Operations							●										●		●		
NAILS Support			●	●		●	●		●	●	●	●	●	●	●			●			
Provisioning			●	●										●							●

1. Maintain Diamond Data Base

(9) Monthly Maintenance Report.

(10) Integrated Support Plan.

(11) Repair Level Analysis Report.

(12) Post Production Support Plan.

(13) Logistics Support Analysis Report.

(14) Spare Parts-Peculiar List.

(15) Contract Training Plan.

(16) Network Engineering Performance Plan.

(17) Network Engineering Quarterly Progress Reports.

(18) Network Engineering Delivery Order Reports.

b. FAA Implementation Plans and Reports. The DMN Phase III DTDM equipment implementation activities will be documented in the plans and reports listed in subparagraph (1).

(1) FAA Documentation	Leads
Project Master Test Plan	ACN-200/ANC-400
NAILS Integrated Logistics Support Plan (ILSP)	ANS-420
DRR Report	ANC-400
Integration and Test Plan	ACN-200
Shakedown Test Plan	ASM-640
JAI Report	Regions/Airway Facilities
Site Preparation Engineering Plan	Regions/Airway Facilities

57. Applicable Documents. The following documents have been referenced and the current version of these documents are applicable to the implementation of the DMN Phase III:

a. FAA-E-2786 Specification Data Multiplexing Network Equipment.

b. FAA-G-1375c Spare Parts-Peculiar for Electronic, Electrical and Mechanical Equipment.

c. FAA-G-2100e Electronic Equipment, General Requirements.

d.	FAA-STD-021a	Configuration Management (Contractor Requirements).
e.	FAA-STD-024	Preparation of Test and Evaluation Plans and Test Procedures.
f.	FAA-STD-036	Preparation of Project Implementation Plans.
g.	Order 1320.1C	FAA Directives System.
h.	Order 1320.48B	Engineering Field Support Sector Maintenance Program Procedures.
i.	Order 1800.58	National Airspace Integrated Logistics Support (NAILS) Policy.
j.	Order 1800.8E	National Airspace System Configuration Management.
k.	Order 1810.4A	FAA Test and Evaluation Program.
l.	Order 2700.31	Uniform Accounting System Operations Manual.
m.	Order 4650.21B	Management In-Use Personal Property.
n.	Order 4800.6	Delegation of Disposal Authority for Personal Property.
o.	Order 6000.22	Maintenance of Two-Point Private Lines.
p.	Order 6030.45	Facility Reference Data File.
q.	NAS-IR-44010001	Interface Requirements Document Digital Transmission Equipment.
r.	NAS-IR-44010002	Interface Requirements Document Analog Transmission Equipment.
s.	NAS-IR-81004303	Interface Requirements Document ARTCC/ACF/DMN.
t.	MIL-STD-1388 1A	Logistic Support Analysis.
u.	MIL-STD-1388 2A	Logistic Support Analysis Record.

58.-59. RESERVED.

CHAPTER 6. PROJECT FUNDING

60. PROJECT FUNDING STATUS, GENERAL. Overall funding for DMN Phase III implementation will be programmed and supplied by ANC-400. Specifically, ANC-400 will provide funds for the purchase, installation, training, and all technical/network engineering services available through the contractor. Additionally, ANC-400 will provide each region sufficient funds to perform site preparation tasks, excluding travel and facilities and equipment project manhours. The following is the projected funding profile for Phase IIIB implementation:

FY91	FY92	FY93	FY94	FY95
$4.5M	$4.0M	$4.0M	$2.3M	$1.5M
FY96	FY97	FY98	FY99	
$1.3M	$1.0M	$0.3M	$0.1M	

61. FUNDING FOR CONTRACTOR MAINTENANCE AND DEPOT REPAIR. Funding responsibilities regarding contractor provided on-call maintenance and depot repair for the Phase III DTDM Project, contract DTFA01-90-D-00024, was awarded to Codex, Inc. The contract is for an initial period of 3 years and has seven renewable one-year option periods. It provides for both on-call maintenance and depot repair based on an assumed 10-year life cycle support scenario.

a. ASM-320 - Telecommunications Network Planning and Engineering. Provides, to the program office, a delivery schedule which indicates the type and quantity of the equipment to be ordered, and the site where the equipment is to be installed.

b. ANC-400 - Interfacility Communications Program.

(1) Issue separate delivery orders, via the contracting officer, for equipment to be delivered and installed and for on-call maintenance and depot repair to be provided by the contractor.

(2) The Interfacility Communication Program (ANC-400) to budget and provide Facilities and Equipment (F&E) funding for contractor on-call maintenance and depot repair through September 30, 1993 (FY-93).

(3) Coordinate with the Technical Standards Program (ASM-120) and the FAA Logistics Center (AAC-400) to ensure operations funding is budgeted and provided for on-call maintenance and depot repair commencing October 1, 1993 (FY-94). The first year for operational funding support in FY-94 will be the established baseline quantity of systems commissioned and accepted by FAA as of September 30, 1993. The quantity of DATAMUX commissioned sites will increase gradually until all systems are delivered. Delivery dates are not firm, but are estimated to be completed in 1998. Any configuration changes requiring procurement action to obtain new line replaceable units (LRU) will require new F&E funding.

c. ASM-120 - Technical Standards. Provide operations funding for Contractor provided on-call maintenance costs commencing October 1, 1993 (FY-94), and for each renewable contract option year thereafter.

d. AAC-400 - FAA Logistics Center. The FAA Logistics Center will provide operations funding for contractor provided depot repair costs commencing October 1, 1993 (FY-94), and for each renewable contract option year thereafter. Fiscal Year 1994 is the first year the FAA Logistics Center can budget and obtain operations funds, since 3 years advance notice must be given to develop new budget and funding. If adequate operations funding can be provided to the FAA Logistics Center prior to FY-94, the FAA Logistics Center will assume support earlier.

62.-69. RESERVED.

CHAPTER 7. DEPLOYMENT

70. GENERAL DEPLOYMENT ASPECTS. The DTDM equipment deployment determination will be made by the Associate Administrator for Airway Facilities (AAF-1). The deployment determination will be based on an FAA assessment of the extent to which the DTDM equipment is ready to be successfully integrated into the NAS and the extent to which the FAA infrastructure is prepared to accept, operate, and support the deployed equipment throughout its life cycle. The general aspects and schedule for the DTDM equipment DRR process are as follows:

a. Figure 7-1 outlines the general DRR process by which the DMN Phase III Program Manager (ANC-400) will lead an FAA review to ensure that the DTDM COTS and non-COTS equipment is ready to be integrated into the NAS and that the FAA is ready to receive, operate, and provide life-cycle support to the equipment when deployed. A separate DRR checklist will be initiated for the COTS and non-COTS equipment. The two key DRR milestones for each activity are as follows:

(1) Initiation of the DRR Process. The program will initiate an internal review of the DRR status upon release of the solicitation. The program manager (ANC-400) and the DRR Program Manager (AAF-11) will convene the project DRR teams.

(2) Submission of the DRR Report and Briefing. After the completion of COTS equipment shakedown testing, the program manager (ANC-400) will submit a DRR report to the Deputy Associate Administrator for Airway Facilities (AAF-2). The same process will be required for the non-COTS equipment.

b. DRR Checklist. A detailed DRR checklist will be used by the DRR team to ensure that all significant areas of concern are identified during the review. The DTDM equipment DRR team will identify issues/concerns requiring action prior to deployment. All open actions will have a status in the DRR report to AAF-2. The checklist will address:

(1) NAS system requirements.

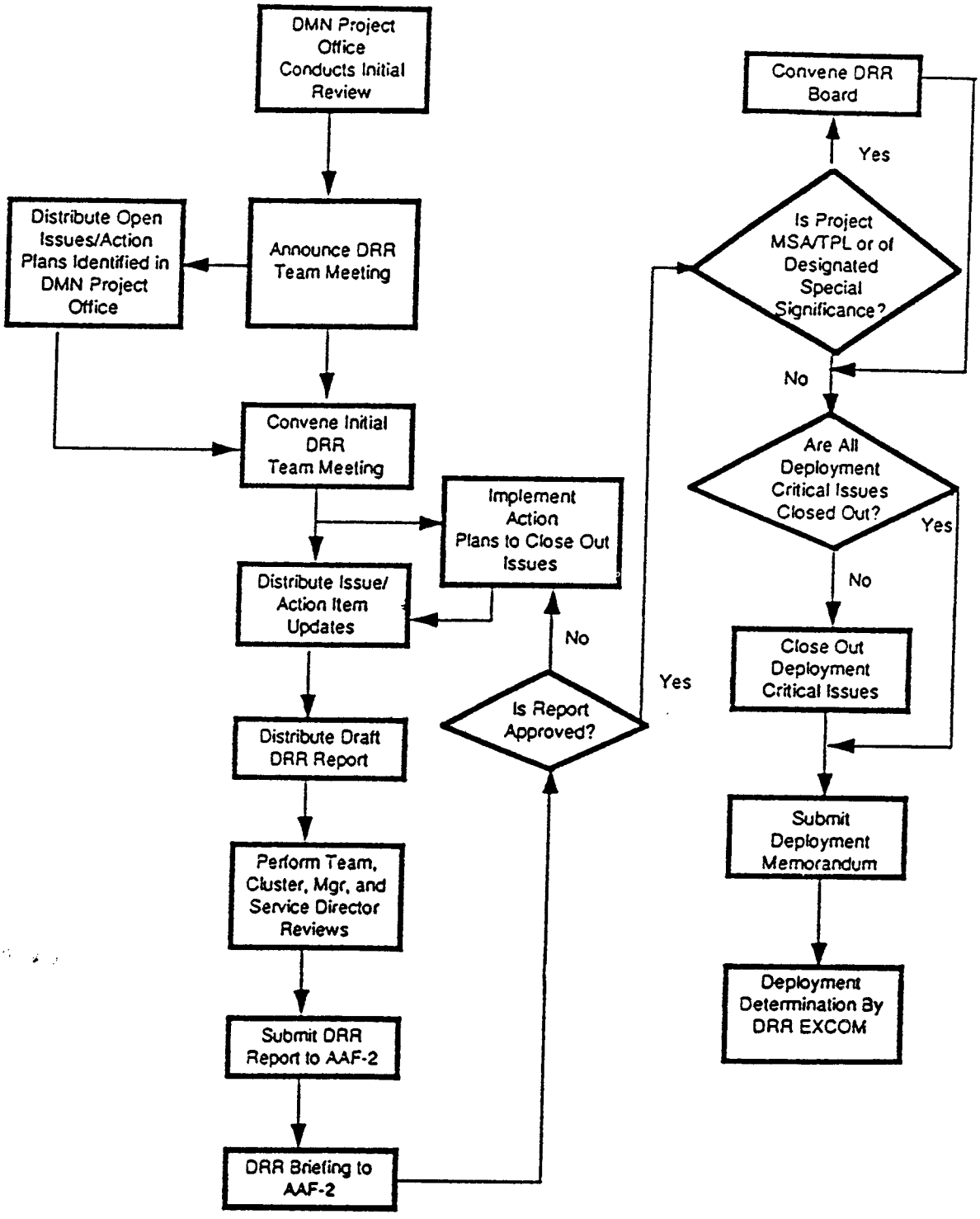
(2) Maintenance planning.

(3) Project implementation.

(4) Contract status.

(5) Configuration management.

FIGURE 7-1. DRR PROCESS



(6) Facility/site preparedness.

(7) Test program.

(8) Software and firmware integration and maintenance.

(9) NAILS.

(10) Training.

(11) Staffing.

(12) Communications.

(13) Man-Machine interface.

(14) Automated information systems security effectiveness.

(15) General.

c. DRR Executive Committee Meetings. The Deputy Associate Administrator for Airway Facilities (AAF-2) will chair the DTDM equipment DRR Executive Committee Meetings that will propose the COTS DTDM equipment deployment determination. During these meetings the deployment determination recommendation for the non-COTS equipment will be presented to the Associate Administrator for Airway Facilities (AAF-1) for approval.

d. The COTS DTDM equipment DRR schedule is as follows:

DRR ACTION	DATE
Initial DRR Review	04/26/89
DRR Team Announcement	05/26/89
Initial DRR Team Meeting	06/27/89
Implement Action Plans/Close Open Issues	07/05/89
Distribute Action Item Updates	Monthly
Program Director and Team Review of Draft Report	08/09/91
Final DRR Report	08/19/91
Convene DRR Executive Committee	08/29/91
DRR Action Item Reports	Monthly (If required)
Deployment Determination	08/30/91

e. The Non-COTS DTDM equipment DRR schedule is as follows:

DRR ACTION	DATE
Initial DRR Review	04/26/89
DRR Team Announcement	06/26/89
Initial DRR Team Meeting	07/26/89
Implement Action Plans/Close Open Issues	08/05/89
Distribute Action Item Updates	Monthly
Perform Program Director and Team Review of Draft Report	08/09/91
Final DRR Report	08/19/91
Convene DRR Executive Committee	08/29/91
Action Item Status Reports	Monthly (If required)
Deployment Determination	08/30/91

71. SITE PREPARATION.

a. Site Preparation activities will include the following:

(1) Delivery Order Preparation. The DMN project office will coordinate DTDM requirements, prepared by ASM-300, and funding arrangements with the affected regional associate program manager prior to issuing delivery orders. At a minimum this coordination will address the following:

(a) Equipment to be installed and site spare requirements.

(b) Site preparation requirements to include the estimated cost and time to complete.

(c) The installation dates that CODEX Corporation must meet.

(2) Site Surveys. CODEX Corporation will require access to various FAA sites to perform site surveys as required to perform work authorized on Installation Delivery Orders. The following items will be included in the site survey:

(a) Equipment to be installed or removed.

(b) What operating equipment might be affected.

(c) Proximity of power plants and distributing systems.

(d) Condition of equipments, floors, walls, etc.

(e) Protection of equipment, floors, walls, etc.

(f) Safety precautions.

(g) Steps requiring the presence of FAA personnel.

(h) Site preparation requirements.

(i) Grounding, bonding, etc.

(3) Site Survey Review. At the completion of any site survey, CODEX Corporation will provide an exit briefing to the site manager, TOR and attending FAA personnel. CODEX Corporation will identify any significant items that would impact the DTDM equipment installation efforts and discuss procedures they will follow during the installation at the site.

b. FAA Organizations. The respective FAA regions and the Mike Monroney Aeronautical Center will be responsible for ensuring that the requisite site preparations are completed on schedule. Regional and local FAA personnel will perform the following site preparation activities:

(1) Provide guidance and assistance to CODEX Corporation during site survey activities.

(2) Establish a configuration baseline for each site which satisfies floor space, location, and power requirements.

(3) Prepare site plans and procedures necessary to receive and support the installation of the DTDM equipment.

(4) Perform site preparation as identified in the site survey report including site engineering and planning, update facility documentation, drill holes through operations floor and walls for cable routing and install AC power and grounding required to support the new equipment.

(5) Support CODEX Corporation during installation, e.g., coordinating installation and integration activities with contractor, escorting contractor personnel to and from the installation site and remaining with the contractor personnel during all installation and integration activities.

72. DELIVERY. The DTDM equipment will be delivered in response to separate delivery orders issued by the FAA contracting officer. These orders will be issued for equipment to fill data communications requirements assigned by ASM-300. CODEX Corporation is required to deliver equipment/services within 90 days of receipt of a delivery order, unless otherwise specified. Delivery orders may be written for equipment, network engineering, installation, maintenance, and training.

73. INSTALLATION PLAN.

a. General. When an installation is ordered by the Government, CODEX Corporation will deliver, unload, inspect, install, configure, integrate, and site test the DTDM equipment. CODEX Corporation's responsibilities will include installation, adaptation, and integration of all Government Furnished Equipment (GFE) and contractor supplied hardware and software/firmware of the DTDM equipment, plus integration of all electrical, mechanical, and functional interfaces. CODEX Corporation will provide, install, and integrate all cabling needed for all internal and external system interfaces except for those cables which are GFE.

b. Site Installation and Integration Plans. CODEX Corporation will prepare a comprehensive installation and integration plan for each site receiving CODEX Corporation installed equipment. This plan will discuss how CODEX Corporation will install the DTDM equipment with minimal impact upon existing facilities and system operation. All installation requirements, characteristics or efforts which are unique to the site will be detailed in the plan. The Site Installation and Integration Plan will be submitted to the FAA for approval within 30 days after receipt of an installation delivery order from the FAA. The plan will be generated based on information obtained from a site survey and will contain all requirements for site preparations to be performed by the FAA. ANC-400 will coordinate the approval of the plan with the regional associate program manager and the site manager.

74.-79. RESERVED.

CHAPTER 8. VERIFICATION

80. FACTORY VERIFICATION. A series of factory and installation tests will be performed by CODEX Corporation.

a. Factory Tests. A complete series of factory tests will be performed by CODEX Corporation on the DTDM equipment prior to shipment. These tests will demonstrate that the hardware, software, and performance requirements of FAA-E-2786 are met. CODEX Corporation will provide all test equipment necessary to perform these factory tests. Factory tests will be considered as pre-installation and integration tests and are broken into a minimum of four classes of testing.

(1) Specification Verification Tests.

(a) COTS hardware and software tests to demonstrate that COTS subsystems meet the requirements of FAA-E-2786 and to demonstrate the functions described in the CODEX Corporation supplied documentation.

(b) Design Qualifications Tests to verify that the design of the developmental items and their associated integration with the COTS hardware and software are properly implemented to meet the requirements of FAA-E-2786, and to demonstrate the functions described in the CODEX Corporation supplied documentation.

(2) Environmental Verification Tests to demonstrate compliance by the production equipment with the electrical and environmental requirements of FAA-E-2786.

(3) Electromagnetic Interference Verification Tests to demonstrate that the production equipment is not affected by electrical or electromagnetic interference created by other equipment in the same or nearby buildings and that the operation of the production equipment does not affect the operation of such other equipment.

(4) Reliability/Maintainability/Availability (RMA) Test to demonstrate compliance with appropriate RMA requirements in FAA-E-2786.

b. Installation Tests. CODEX Corporation will perform an inventory, inspection, and validation of the DTDM hardware and software installed at each site. The success of the installation will be verified by performing factory equipment diagnostics testing at the site.

81. CHECKOUT. CODEX Corporation will perform an equipment checkout to demonstrate that the installed equipment meets the functional performance requirements of FAA-E-2786 for the basic equipment and any installed options. Checkout will include the following:

a. Testing of the installed equipment to verify that integrated hardware and software meet specified functional and operational performance at each site.

b. Verifying that required support items such as support manuals, are available, technically compatible and in compliance with the contract requirements.

c. Verification of the DTDM equipment installation at the site by the participating TOR when checkout has been successfully completed and approved by the site manager. Final acceptance of the installed equipment will be deferred until satisfactory completion, by CODEX Corporation, of the Site Acceptance Test and a 30-day, trouble-free, operation period.

82. CONTRACTOR INTEGRATION TESTING. CODEX Corporation will perform integration testing at each site after installation of the DTDM equipment. This testing will demonstrate that the DTDM equipment meets its functional and system-level performance requirements, has been integrated as specified and that it can interface and operate with specified external systems/subsystems.

83. CONTRACTOR ACCEPTANCE INSPECTION (CAI).

a. General. The DTDM equipment will be procured using a requirements type contract for several pieces of equipment instead of a system. This creates some unique circumstances which must be considered.

(1) CODEX Corporation will perform a CAI as part of each installation ordered by the Government.

(2) The acceptance test plans and procedures will be prepared by CODEX Corporation and approved by the Government.

(3) The acceptance tests for the DTDM equipment will be performed by CODEX Corporation and witnessed by the Government. Government witnesses may include the TOR, regional associate program manager, ASM-640, ACN-200, DMN Program Office (ANC-400) and the support contractor. Also the appropriate ALG-420 field Quality Reliability Officer will witness all acceptance tests. Since there will be many installations during the contract period, the

primary Government witness at most installations will be the TOR. The Government will have the right to separately perform and repeat any test.

(4) Formal acceptance, of any piece of equipment installed at an FAA site, will occur after CAI and a 30-day trouble-free equipment operation.

(5) Formal acceptance, of a piece of equipment not installed at an FAA site, will occur 5 days after receipt by the Government.

84. FAA INTEGRATION TESTING. Initial NAS integration testing will be conducted at a first site to ensure that the DTDM equipment can operate in the NAS environment. It will include test requirements in the NAS that cannot be adequately tested at project level testing. The following activities will support the NAS integration testing:

a. Initial Integration Testing.

(1) ACN-200 will be responsible for the overall conduct of NAS integration testing for the DTDM equipment. In support of these integration tests, CODEX Corporation will provide the appropriate technical personnel to isolate and correct any technical and operational deficiencies. The NAS IT&E will be executed in accordance with Order 1810.4A, FAA Test and Evaluation Program.

(2) The NAS integration testing for the DTDM equipment will be conducted by ACN-200 and monitored by the DMN Project Leader (ANC-140), and ASM-640.

(3) The test plan for the NAS integration testing will be prepared by ACN-200 and provided to the DMN Program Manager (ANC-400) for approval. The plan will be prepared in accordance with FAA-STD-024, Preparation of Test and Evaluation Plans and Test Procedures.

b. Site Integration Testing. During the DTDM equipment contract, items of equipment will be installed at FAA sites to satisfy requirements for data communications. This will require the performance of integration testing at each site.

(1) CODEX Corporation will develop and prepare a site Installation/Integration Plan which will include integration testing for approval by the Project Leader, ANC-140.

(2) The TOR for the site will coordinate/witness CODEX Corporation performing the integration testing at the site.

85. SHAKEDOWN AND CHANGEOVER.

a. General. Shakedown testing for the DTDM equipment will be conducted as specified in Order 1810.4A. It will determine the operational effectiveness of the DTDM equipment by assessing the integrated readiness of people, procedures, and equipment to assume field operational status within the NAS.

b. Shakedown. The shakedown will be accomplished in several phases. ASM-640, in cooperation with ANC-400 and the designated equipment sites, will stage the shakedown testing for the DTDM equipment. CODEX Corporation will provide technical assistance, as required, to isolate and correct any technical and operational deficiencies. The tests will provide FAA site personnel with first-hand operational experience on the DTDM equipment and permit them to identify defects or abnormalities in the equipment operation.

(1) In as much as possible, the following will be observed during the shakedown tests: reliability, availability, safety, human factors, and any nonstandard occurrence which might be encountered in network operation and maintenance.

(2) The shakedown testing will test the functional and operational requirements of FAA-E-2786 not previously tested during the Operational Capability Demonstration.

(3) Shakedown testing will be conducted by ASM-640 and monitored by the DMN Project Leader (ANC-140), ACN-200, and the TOR.

(4) Shakedown test plans and procedures for DTDM equipment will be prepared by ASM-640 and coordinated in accordance with Order 1810.4A.

86. JOINT ACCEPTANCE INSPECTION (JAI).

a. General. The JAI is the process which the Airway Facilities sector will use to formally accept custody of the DTDM equipment and assume responsibility for maintenance as provided by the contract. JAI will be accomplished near the end of each site implementation and prior to the ORD for that equipment. The JAI is an inspection activity to gain consensus of the involved FAA offices that the DTDM equipment implementation has been

completed in accordance with applicable specifications and standards, and that the equipment is capable of providing the services required within established standards and tolerances.

b. Procedures. The procedures and participants for the JAI are described in Order 6030.45. The DTDM equipment installations may require multiple JAI's at any given site. A JAI will be performed for each equipment installation at a site.

c. Required Preparations. The following items must be accomplished prior to performing the JAI for a site.

(1) Based on the delivery order, inspect and inventory the equipment delivered to the site by completing FAA Form 4500-1, Project Material Shipping Notice/Receiving Report.

(2) Completion of site installation and specific site installation testing.

(3) Completion of the CAI for the site.

(4) Initial acceptance of the DTDM equipment by the FAA (operating properly but having not completed the 30-day, trouble-free operational period).

(5) Completion of shakedown testing (where required).

(6) Correction of all identified discrepancies or uncompleted items from CAI, and FAA integration and shakedown testing (where required).

(7) Completion/review of the JAI report forms (FAA Forms 6030-18 through 6030-25).

(8) Notification of joint acceptance board (JAB) to convene.

d. Joint Acceptance Board. A JAB will be convened to formally conduct the JAI for each DTDM equipment installation at a site. The JAB consists of representatives of the Airway Facilities sector, Air Traffic, ANC-400 program office responsible for project implementation, and others, as appropriate. The composition and responsibilities of the JAB are described in Order 6030.45.

e. JAI Report. FAA Forms 6030-18 through 6030-25 will be used to document all the findings of the board. The Chairman of the JAB is responsible for the JAI Report.

87.-89. RESERVED.

CHAPTER 9. INTEGRATED LOGISTIC SUPPORT

90. MAINTENANCE CONCEPT.

a. General. The primary source for maintenance support for DTDM equipment will be the CODEX Corporation. The program office is the primary interface point for contract maintenance support for the period through and including September 30, 1993, after which the contract funding, monitoring, and administration will be transfered to the Technical Standards Branch, ASM-120. The basic type of maintenance to be provided by CODEX Corporation is corrective maintenance; which includes both on-call and depot repair.

b. Contractor Corrective Maintenance. CODEX Corporation shall provide a total maintenance support package for the DTDM equipment. Maintenance will be provided by CODEX Corporation either onsite or at a contractor depot. CODEX Corporation shall provide the following maintenance support:

(1) On-Call Maintenance. CODEX Corporation shall provide on-call corrective maintenance on selected DTDM equipment as ordered by the Government. The FAA will determine which equipment requires on-call corrective maintenance and issue a maintenance delivery order for those equipments. CODEX Corporation will provide 24-hour, 7 days per week coverage of all repair actions, corrective maintenance and parts required to restore the equipment specified in the delivery order. CODEX Corporation personnel are required to arrive at all ARTCC's within 2 hours of notification. All other FAA facilities require CODEX Corporation personnel arrival onsite within 5 hours. ANC-140 will fund, monitor, and administer the on-call corrective maintenance portion of the contract through September 30, 1993, after which that responsibility will be transferred to ASM-120. Procedures outlining the responsibilities of the FAA and CODEX personnel will be developed by ANC-140, ASM-120, and AAF. This will be done before the end of installation by CODEX Corporation.

(2) Depot Maintenance. CODEX Corporation will provide depot-level corrective maintenance for DTDM equipments not receiving on-call corrective maintenance, as ordered by the Government. This includes routine repair within 30 days after receipt of an unserviceable item, expedite repair within 3 working days, and emergency repair within 24 hours. The FAA Logistic Center will act as an exchange point for defective equipment between the operational site and CODEX Corporation's maintenance depot. At the present time, the FAA Logistics Center will monitor the CODEX Corporation depot-level maintenance.

(3) Contract Period. The initial period of the contract is 3 years. There are seven one-year options available for the DTDM contractors to perform on-call and depot-level corrective maintenance. The FAA Logistics Center may award an annual repair contract, if needed, after the expiration of the contract options.

c. Contractor Preventive Maintenance. Preventive maintenance will not be performed by the Contractor. According to CODEX Corporation's preventative maintenance policy, no preventative maintenance is required on any equipment delivered.

d. FAA Maintenance.

(1) FAA Logistics Center Requirements.

(a) CODEX Corporation will perform equipment maintenance during the life of the contract. While CODEX Corporation is performing the maintenance, ANC-140 will order the spare equipments, line replaceable units (LRU) and parts according to the PPL, to be placed in the FAA Logistics Center. FAA Logistics Center personnel will attend the CODEX Corporation training program for equipment maintenance.

(b) The FAA Logistics Center will operate in an exchange mode for DTDM equipment. The ARTCC's will contact the FAA Logistics Center when the need to obtain contractor depot level repairs occurs. The ARTCC will send damaged LRU's to the FAA Logistics Center. The FAA Logistics Center will send spare LRU to the operational sites, send the damaged LRU to the CODEX Corporation depot and coordinate repair of the damaged LRU.

(c) CODEX Corporation will provide depot repair support throughout the life of the contract. The FAA Logistics Center may elect to accept depot repair responsibilities at any time, provided that adequate spares, technical documentation, and training are available.

(2) FAA Site Requirements.

(a) FAA site personnel will be required to notify CODEX Corporation, via a predetermined mechanism, of a failure to receive on-call corrective maintenance. Site personnel will also be required to test, remove, and ship defective equipment to the FAA Logistics Center which requires contractor depot maintenance. Site personnel will attend training provided by CODEX Corporation for the operation and maintenance of the DTDM equipment.

(b) FAA Logistics Center, in coordination with the program office (ANC-400), will develop the Initial Supply Support Allowance Chart (ISSAC) and determine which items must be ordered from the FAA Logistic Center.

(c) When adequate spares and trained technicians are available, the responsibility for on-call corrective maintenance may be shifted to FAA personnel. No LRU repair will take place below the depot level.

(d) For subparagraphs 90.d(a) and (c) ANC-140 and ASM-120 will develop detailed procedures as to how they are to be accomplished. Names, phone numbers, and the criteria for maintenance shifting to FAA personnel, will be the main part of those procedures.

(e) FAA site maintenance personnel shall support CODEX Corporation by accompanying all contractor maintenance personnel to and from the equipment installation site and remaining on hand during accomplishment of any maintenance action.

e. Second-Level Support.

(1) Contractor. CODEX Corporation will provide assistance to solve site-unique problems by providing direct support to the DMN sites via a toll-free telephone advisory service or onsite technical assistance visits when required. When technical assistance is provided to FAA technicians, the contractor will provide all required test equipment and diagnostics software.

(2) FAA. Systemwide problems will be addressed within ASM-610 which will coordinate circuit problems and hardware/software upgrades with CODEX Corporation. Support to ASM-610 will be provided by CODEX Corporation via the toll-free telephone advisory service and onsite technical assistance.

91. TRAINING.

a. General. CODEX Corporation will develop and conduct a complete training program for FAA personnel, including those at all locations with DMN equipment, engaged in management, operations, hardware and software maintenance, and training operations and maintenance personnel. The FAA Academy will evaluate and make recommendations to the DMN Project Leader on the training program. ASM-260 will assist in the evaluation of the training program.

b. Training Courses. CODEX Corporation will provide the following training courses:

(1) Operations/Maintenance Courses. CODEX Corporation will provide training courses which at a minimum will provide complete instruction, including hands-on training for site operation/maintenance of the following:

(a) Modems/multiplexers and limited distance modems.

(b) Ancillary equipment.

(c) CSU/DSU and HSTDM's.

(2) Vendor Certification. The students who complete the operations/maintenance training courses shall be certified as vendor qualified and shall be able to:

(a) Perform equipment powerup, powerdown, startup, startover, recovery, and change of operational modes.

(b) Locate and identify all assemblies and sub-assemblies.

(c) Analyze and identify problems by interpreting results of functional and diagnostics tests.

(d) Use functional and flow diagrams and test equipment, as required, to locate malfunctions to the appropriate LRU.

(e) Perform periodic maintenance as required.

(f) Remove and replace faulty LRU's.

(3) ANMS Operations. CODEX Corporation will provide an ANMS operations course and shall certify graduates as vendor qualified to:

(a) Perform system startup, startover, recovery, and change of operational modes.

(b) Reconfigure the network.

(c) Operate the system line printer.

(d) Identify and execute system commands, configuration, and input messages.

(e) Interpret error messages and take appropriate corrective action.

(f) Describe the functional operation of the ANMS, including all system inputs and outputs.

(g) Execute ANMS programs.

(h) Execute diagnostic and error reporting modules; and analyze error and configuration messages.

(3) DMN Overview. This course is designed for DMN management personnel and other managers involved with programs which use the data communications service provided by the DTDM equipment. It will provide an overview of data multiplexing technology, the DMN and the equipment to be employed in the DMN. Course graduates shall have:

(a) A basic understanding of analog and digital data transmission.

(b) A basic understanding of multiplexing theory.

(c) A basic understanding of the structure of the DMN.

(d) A basic understanding of network monitoring and system restoral.

(e) The ability to identify all the equipment used in the DMN.

c. Attrition Training. The FAA Academy will develop a plan for Attrition Training using CODEX Corporation provided documentation.

d. FAA Training Program. AHT-400 will initiate action to implement the FAA follow-on training program for DTDM equipment.

92. SUPPORT TOOLS AND TEST EQUIPMENT.

a. Special tools, test/support equipment and/or interface devices required to support the DTDM equipment will be held to a minimum.

b. CODEX Corporation will identify in the provisioning technical documentation all common tools, test/support equipment, interface devices and connectors needed to maintain the DTDM equipment.

93. SUPPLY SUPPORT.

a. General. CODEX Corporation will provide spares for initial provisioning, as ordered by the Government, after the provisioning conference. The type and quantity of spares ordered will be based on an analysis of the provisioning technical documentation (PTD) provided by the contractor and verified in the data records. Spare parts-peculiar will be delivered to the FAA Logistics Center in accordance with FAA-G-1375, paragraph 4.2. Common parts will be identified in the PTD, but will be procured separately by the FAA Logistics Center and provided to the appropriate stockage locations in accordance with established FAA supply procedures.

b. Supply Support Levels.

(1) Operational Site. Site requirements, including quantity and location, for spare LRU's will be determined by the Project Leader (ANC-140), in consultation with the regional associate program manager, prior to the submission of delivery orders.

(2) FAA Logistics Center. No piece parts repairs will be conducted at the FAA Logistics Center. The FAA Logistics Center will act as an exchange point for defective LRU's between the FAA site and the contractor's maintenance depot. The FAA Logistics Center, assisted by ANC-140, will determine the quantity of LRU's to be stored at the FAA Logistics Center to support the exchange program.

(3) Contractor Depot. The CODEX Corporation depot will maintain a supply level and provide a source of safety stock as determined during the DTDM provisioning conference. Safety stocks will be maintained for parts not expected to fail frequently but are critical in avoiding long maintenance downtimes.

94. VENDOR DATA AND TECHNICAL MANUALS.

a. CODEX Corporation shall establish and maintain a Logistics Support Analysis (LSA) Program in accordance with MIL-STD-1388-1 and -2. The LSA Program will support the accomplishment of LSA program tasks. The data and information generated from the LSA will be recorded and stored to the contractor established and maintained automated LSA Record (LSAR) system.

b. CODEX Corporation will provide the Parts Master File in accordance with Appendix C of MIL-STD-1388-2A.

c. Provisioning will be performed down to the LRU in accordance with MIL-STD-1388-2A, MIL-STD-1561, and DD Form 1949-1 (LSAR Data Selection sheet) and -2 (Provisioning Requirements Statements.

d. CODEX Corporation will host a Provisioning Conference approximately 30 days after providing the following acceptable provisioning technical data: Parts Master File documentation, failure data, drawings, and samples of equipment, assemblies, and replaceable parts on the provisioning parts list (PPL).

95. EQUIPMENT REMOVAL. The Phase III DTDM equipment will replace some older nonsupportable/nonproduction items in the Phase I/II network. All equipment removed from the Phase I/II network will be disposed of in accordance with Order 4800.6, Delegation of Disposal Authority for Personal Property.

96. FACILITIES. DTDM equipment will be configured to fit within existing space allocated at the FAA facilities for data multiplexers. Specific space requirements for equipment have been identified in paragraph 32. No special responsibilities have been assigned to the Government for designing, developing, or acquiring support facilities.

97. EQUIPMENT ACCOUNTABILITY. Accountability and recording of equipment will be accomplished in accordance with Order 4650.21B, Management In-Use Personal Property. Property that is recorded in the Uniform Accounting Systems will be accomplished in accordance with Order 2700.31, Uniform Accounting System Operations Manual.

98.-99. RESERVED.

CHAPTER 10. ADDITIONAL PROJECT IMPLEMENTATION ASPECTS

100. CONFIGURATION MANAGEMENT.

a. Acquisition Configuration Management.

(1) CODEX Corporation will establish, implement, and maintain a configuration management program for the DTDM equipment program. The program will ensure that Hardware Configuration Items and all documentation produced under the contract are under continuous configuration control.

(2) In support of the configuration management program, CODEX Corporation will implement and maintain an internal Configuration Status Accounting System. The system will document the configuration identification and determine the status of Engineering Change Proposals, deviations, and waivers.

(3) CODEX Corporation will prepare and submit for ANC-400 approval a Configuration Management Plan in accordance with FAA-STD-021. The plan will describe the CODEX Corporations procedures for both baseline identification and control, as well as audit and configuration status accounting of hardware, documentation and support equipment.

b. Implementation Configuration Control.

(1) ASM-640 will assume the responsibility for maintaining the operational DMN baseline configuration per Order 1320.48, Engineering Field Support Sector Maintenance Program Procedures. Guidance and procedures in Order 1800.8E will be followed to ensure a smooth and efficient transfer between the project office and the system maintenance office.

(2) ANC-140 and ASM-640 will develop a handoff agreement concerning the configuration management transition. This agreement will be added as a future addendum to this order.

101.-109. RESERVED.

APPENDIX 1.

DATA MULTIPLEXING NETWORK PROJECT IMPLEMENTATION SCHEDULE

Location	Site Survey Start	Site Survey End	Site Survey Report Completed	Site Readiness Review	Equipment Delivery	Installation Start	Installation End	Site Acceptance Test Start	Site Acceptance Test End	Operational Readiness Demonstration Start	Operational Readiness Demonstration End	Partial IAI
ZMP	01/14/91	02/12/91	03/14/91	06/12/91	07/29/91	08/12/91	10/08/91	10/09/91	10/15/91	10/16/91	12/17/91	12/18/91
ZDV	02/05/91	03/06/91	04/05/91	07/08/91	08/19/91	09/03/91	10/30/91	10/31/91	11/06/91	11/07/91	01/20/92	01/21/92
ZAB	02/26/91	03/27/91	04/26/91	07/25/91	09/09/91	09/23/91	11/20/91	11/21/91	11/30/91	12/12/91	02/08/92	02/10/92
ZAN	03/19/91	04/17/91	05/17/91	08/15/91	09/30/91	10/14/91	12/14/91	12/16/91	12/21/91	01/06/92	03/05/92	03/06/92
ZNY	04/09/91	05/08/91	06/07/91	09/05/91	10/21/91	11/04/91	01/14/92	01/15/92	01/21/92	01/22/92	03/21/92	03/23/92
ZBW	04/30/91	05/29/91	06/28/91	09/26/91	11/12/91	11/25/91	02/04/92	02/05/92	02/11/92	02/12/92	04/11/92	04/13/92
ZMA	05/21/91	06/19/91	07/19/91	10/17/91	12/04/91	12/18/91	02/25/92	02/26/92	03/03/92	03/04/92	05/02/92	05/04/92
ZSU	06/11/91	07/10/91	08/09/91	11/07/91	01/06/92	01/20/92	03/17/92	03/18/92	03/24/92	03/25/92	05/23/92	05/25/92
ZHN	06/25/91	07/24/91	08/23/91	11/25/91	01/20/92	02/03/92	03/31/92	04/01/92	04/07/92	04/08/92	06/05/92	06/08/92
FAATC	07/09/91	07/31/91	08/30/91	12/02/91	01/27/92	02/10/92	04/07/92	04/08/92	04/14/92	04/15/92	06/13/92	06/15/92
OKC	07/23/91	08/21/91	09/20/91	12/20/91	02/17/92	03/02/92	04/28/92	04/29/92	05/05/92	08/06/92	07/04/92	07/06/92
ZKC	08/13/91	09/11/91	10/11/91	01/22/92	03/09/92	03/23/92	05/19/92	05/20/92	05/26/92	05/27/92	07/25/92	07/27/92
ZOB	09/03/91	10/02/91	11/01/91	02/12/92	03/30/92	04/13/92	06/09/92	06/10/92	06/16/92	06/17/92	08/15/92	08/17/92
ZAU	09/24/91	10/23/91	11/22/91	03/04/92	04/20/92	05/04/92	06/30/92	07/01/92	07/07/92	07/08/92	09/05/92	09/08/92
ZID	10/15/91	11/13/91	12/16/91	03/25/92	05/11/92	05/26/92	07/21/92	07/22/92	07/28/92	07/29/92	09/26/92	09/28/92
ZDC	11/05/91	12/07/91	01/16/92	04/15/92	06/01/92	06/15/92	08/11/92	08/12/92	08/18/92	08/19/92	10/17/92	10/19/92
ZJX	12/03/91	01/11/92	02/10/92	05/11/92	06/24/92	07/08/92	09/05/92	09/07/92	09/13/92	09/14/92	11/11/92	11/12/92
ZHU	01/07/92	02/05/92	03/06/92	06/04/92	07/20/92	08/03/92	09/30/92	10/01/92	10/07/92	10/08/92	12/09/92	12/10/92
ZTL	01/28/92	02/26/92	03/27/92	06/25/92	08/09/92	08/23/92	10/21/92	10/22/92	10/28/92	10/29/92	01/09/93	01/11/93
ZME	02/18/92	03/18/92	04/17/92	07/16/92	08/31/92	09/14/92	11/11/92	11/12/92	11/18/92	11/19/92	01/30/93	02/01/93
ZFW	03/10/92	04/08/92	05/08/92	08/06/92	09/21/92	10/05/92	12/05/92	12/07/92	12/12/92	12/14/92	02/20/93	02/22/93
ZLC	03/31/92	04/29/92	05/29/92	08/27/92	10/12/92	10/26/92	01/05/93	01/06/93	01/12/93	01/13/93	03/13/93	03/15/93
ZLA	04/21/92	05/20/92	06/19/92	09/17/92	11/02/92	11/16/92	01/26/93	01/27/93	02/02/93	02/03/93	04/03/93	04/05/93
ZSE	06/02/92	07/01/92	07/31/92	10/29/92	12/16/92	01/09/93	03/09/93	03/10/93	03/16/93	03/17/93	05/15/93	05/17/93
ZOA	06/23/92	07/22/92	08/21/92	11/19/92	01/19/93	02/04/93	04/04/93	04/05/93	04/11/93	04/12/93	06/10/93	06/11/93

APPENDIX 2. LISTING OF DTDM PROGRAM PERSONNEL

Organization	Title	Name	Telephone Numbers	
			FTS	Commercial
ANC-400	Program Manager	Joan Gariazzo	967-4954	202-646-4954
ANC-140	DMN Project Leader	Paul Sass	967-4953	202-646-4953
ANS-420	NAILS Assoc. P.M. for Logistics	Jack Daly	267-7478	202-267-7478
ALG-330	Contracting Officer	John Vogt	267-3620	202-267-3620
ALG-330	Contracting Specialist	Peggy Abernethy	267-7543	202-267-7543
ASM-300	Division Manager	Glen Waugaman	267-8225	202-267-8225
ASM-310	DMN Network Manager	Charles Jones	267-7150	202-267-7150
ASM-320	DMN Network Engineer	Dan Chess	267-8800	202-267-8800
ASW-482.2	Lead Region Engineer	Ray Jarrett	734-3231	817-740-3231
AAL-421A	Regional Assoc. P.M.	Leonard Grau	271-4609	907-271-4609
ACE-425.8	Regional Assoc. P.M.	Jeff Yarnell	867-5676	816-426-5676
AEA-452.2	Regional Assoc. P.M.	Philip Harper	667-1988	718-917-1988
AGL-421.6	Regional Assoc. P.M.	Mel Banks	384-7593	312-694-7593
ANE-422P	Regional Assoc. P.M.	Cal Phillips	836-7210	617-273-7210
ANM-455E	Regional Assoc. P.M.	Mark Gordhamer	392-2391	206-227-2391
ASO-422.6	Regional Assoc. P.M.	Tom Hevlin	246-7371	404-763-7371
ASW-422.5	Regional Assoc. P.M.	Randy Morton	734-5286	817-624-5286
AWP-454.13	Regional Assoc. P.M.	Tom Paullus	984-1218	213-297-1218
ASE-600	Configuration Management	Robert Demont	267-9788	202-267-9788
ALG-100	Policy and Plans	Richard Hirornume	267-8919	202-267-8919
ALG-200	NAS Support	Jonnie Gamble	267-8845	202-267-8845
ALG-400	Industrial Division	Alphonso Barr	267-8268	202-267-8268
ALG-420	Quality Assurance Group	Kenneth Laenger	267-7037	202-267-7037
AHT-400	Training	Gary Baldwin	366-7400	202-366-7400
ASM-120	Technical Standards	Irene Nowotney	267-7254	202-267-7254
ASM-200	Maintenance Operations	Peter Kachis	267-3597	202-267-3597
ASM-260	Operations Program	Bob Hodge	267-8290	202-267-8290
ACN-260	DMN Test Director	Wayne Bell	482-5271	609-484-5271
AAC-400	FAA Logistics Center	Vina Showers	747-4358	405-680-4358
AAC-900	FAA Academy	Robert Bartanowicz	747-6900	405-680-6900
ASM-610	Systems Eng. Branch	George Francis	747-3724	405-680-3724
ASM-640	NAV/COM Eng.	Joe Hoffert	747-3644	405-680-3644

APPENDIX 3. DTDM EQUIPMENT RACK CONFIGURATIONS

Rack Type: AR-1

Applies to Racks Numbered 5, 6, 13, 14, and 15.

Rack Size:	Width	2 feet 3/4 inches
	Length	2 feet 9 inches
	Height	6 feet 4 inches
Installed Equipments:		Codex 3600 CP 3 Power Filters
Foot Print:	Width	2 feet 3/4 inch
	Length	2 feet 9 inches

Power Requirements:

Critical:	Phase	1	
	vac	120	
	KVA	2.5	
	Circuit Breakers	3 @ 15 Amps	
Nonessential:			
	Circuit Breaker	1 @ 15 Amps	for Convenience Outlet

Rack Type: AR-2

Applies to Rack Numbered 4

Rack Size:	Width	2 feet 3/4 inches
	Length	2 feet 9 inches
	Height	6 feet 4 inches
Installed Equipments:		Codex HSTDM 6216 3 Power Filters
Foot Print:	Width	2 feet 3/4 inch
	Length	2 feet 9 inches

Power Requirements:

Critical:	Phase	1	
	vac	120	
	KVA	2.5	
	Circuit Breakers	3 @ 15 Amps	
Nonessential:			
	Circuit Breakers	1 @ 15 Amps	for Convenience Outlet

Rack Type: AR-3

Applies to Rack Numbered 3

Rack Size:	Width	2 feet 3/4 inches
	Length	2 feet 9 inches
	Height	6 feet 4 inches
Installed Equipments:		Codex A/B Switches
		4 EIA Patch Panels
		3 Power Filters
Foot Print:	Width	2 feet 3/4 inch
	Length	2 feet 9 inches

Power Requirements:

Critical:	Phase	1	
	vac	120	
	KVA	2.5	
	Circuit Breakers	3 @ 15 Amps	
Nonessential:			
	Circuit Breakers	1 @ 15 Amps	for Convenience Outlet and EIA Monitor

Rack Type: AR-4

Applies to Racks Numbered 7, 8, 10, 11, and 12.

Rack Size:	Width	2 feet 3/4 inches
	Length	2 feet 9 inches
	Height	6 feet 4 inches
Installed Equipments:		2 VF Patch Panels
		7 EIA Patch Panels
Foot Print:	Width	2 feet 3/4 inch
	Length	2 feet 9 inches

Power Requirements:

Critical:	None		
Nonessential:			
	Circuit Breakers	1 @ 15 Amps	for Convenience Outlet and EIA Monitor

Rack Type: AR-5

Applies to Racks Numbered 1 and 2

Rack Size:	Width	2 feet 3/4 inches	
	Length	2 feet 9 inches	
	Height	6 feet 4 inches	
Installed Equipments:		Codex Digital Bridges	
		2 EIA Patch Panels	
		3 Power Filters	
Foot Print:	Width	2 feet 3/4 inch	
	Length	2 feet 9 inches	
Power Requirements:			
Critical:		Phase 1	
		vac 120	
		KVA 2.5	
		Circuit Breakers 3 @ 15 Amps	
Nonessential:			
		Circuit Breakers 1 @ 15 Amps	for Convenience Outlet and EIA Monitor

Rack Type: AR-6

Applies to Rack Numbered 6.

Rack Size:	Width	2 feet 3/4 inches	
	Length	2 feet 9 inches	
	Height	6 feet 4 inches	
Installed Equipments:		Codex 9820 CAP (ANMS)	
		3 Power Filters	
Foot Print:	Width	2 feet 3/4 inch	
	Length	2 feet 9 inches	
Power Requirements:			
Critical:		Phase 1	
		vac 120	
		KVA 2.5	
		Circuit Breakers 3 @ 15 Amps	
Nonessential:			
		Circuit Breakers 1 @ 15 Amps	for Convenience Outlet

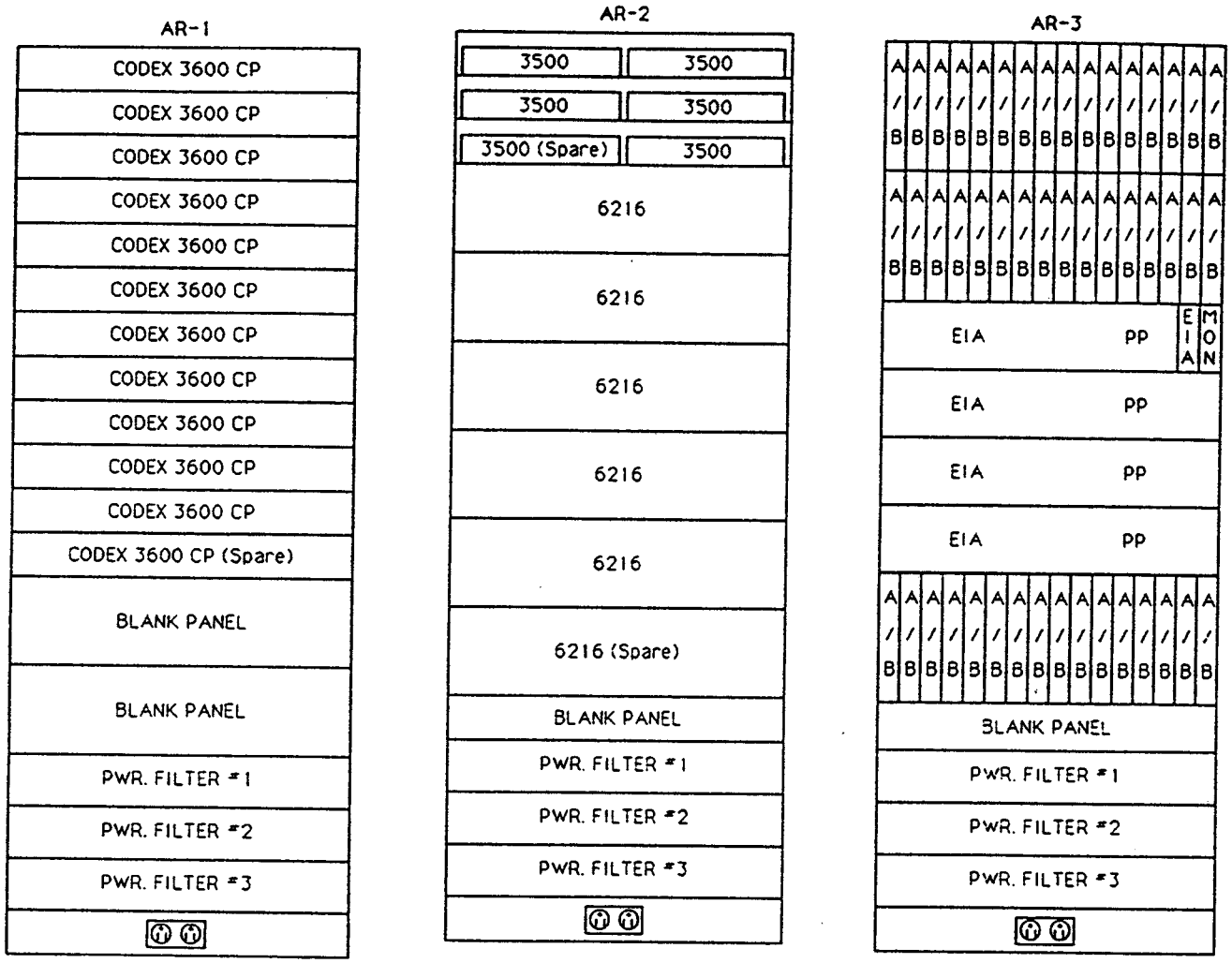
Rack Type: AR-7

Applies to Rack Numbered 9.

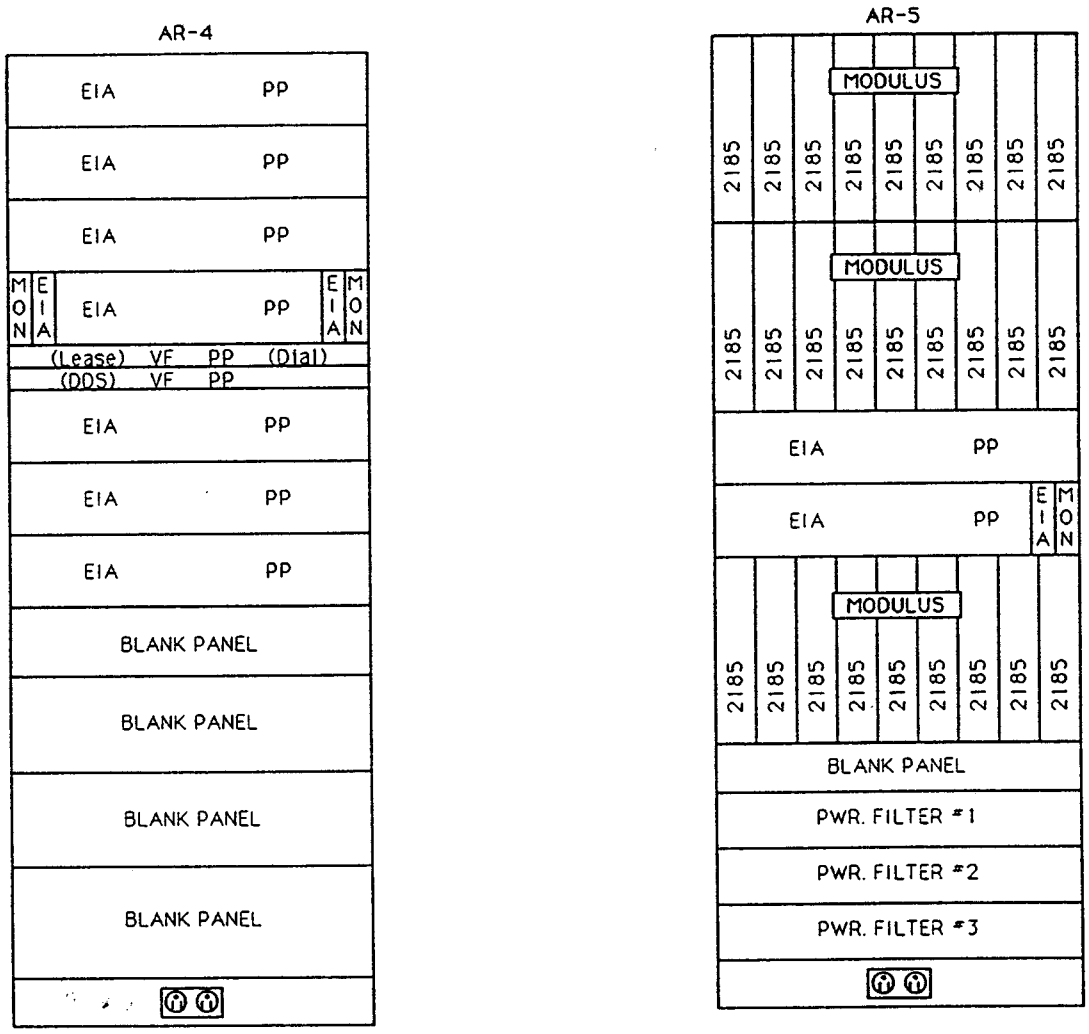
Rack Size:	Width	2 feet 3/4 inches
	Length	2 feet 9 inches
	Height	6 feet 4 inches
Installed Equipments:		2 VF Patch Panels
		6 EIA Patch Panels
		1 V-35 Patch Panel
Foot Print:	Width	2 feet 3/4 inch
	Length	2 feet 9 inches

Power Requirements:

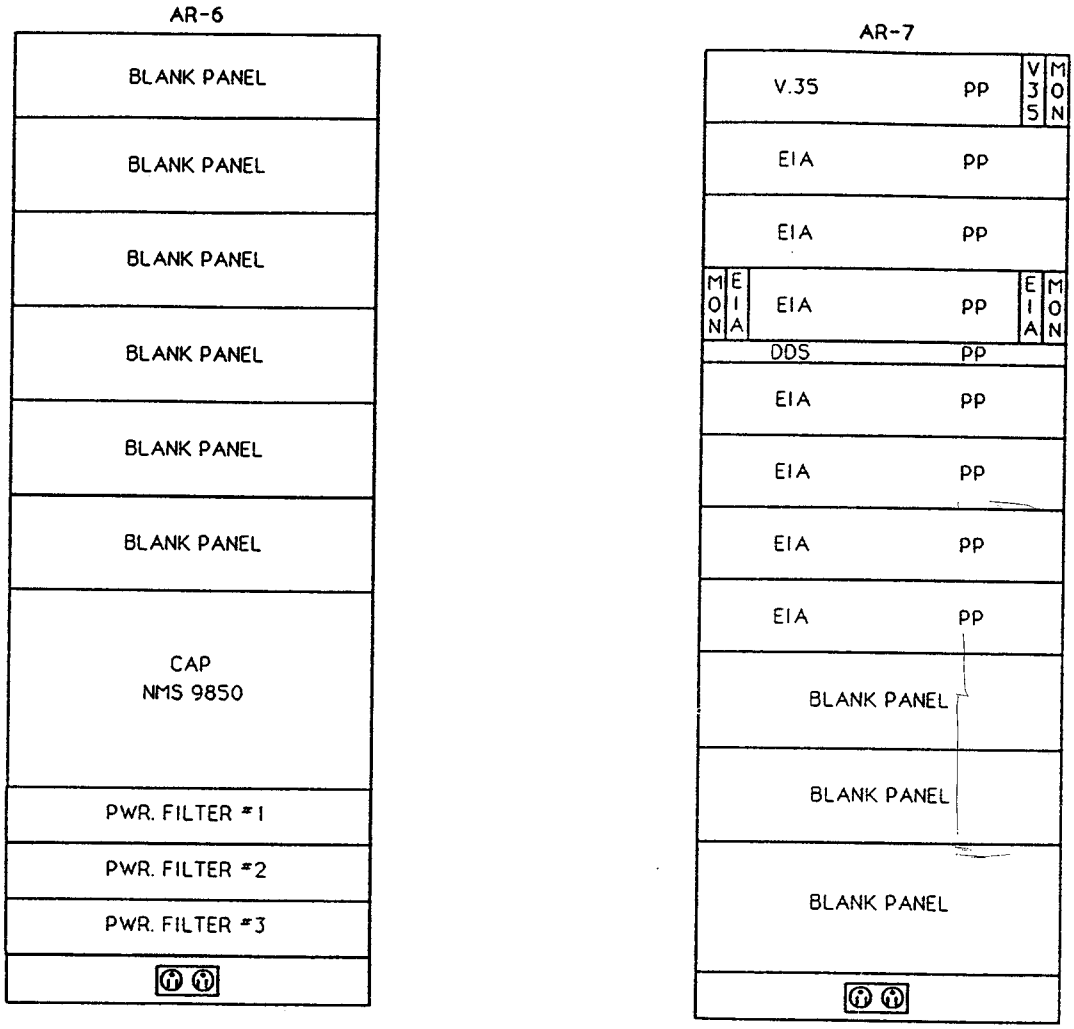
Critical:	None		
Nonessential:	Circuit Breakers	1 @ 15 Amps	for Convenience Outlet and EIA Monitor



DMN ARTCC AR-1, AR-2, AND AR-3 RACK CONFIGURATIONS

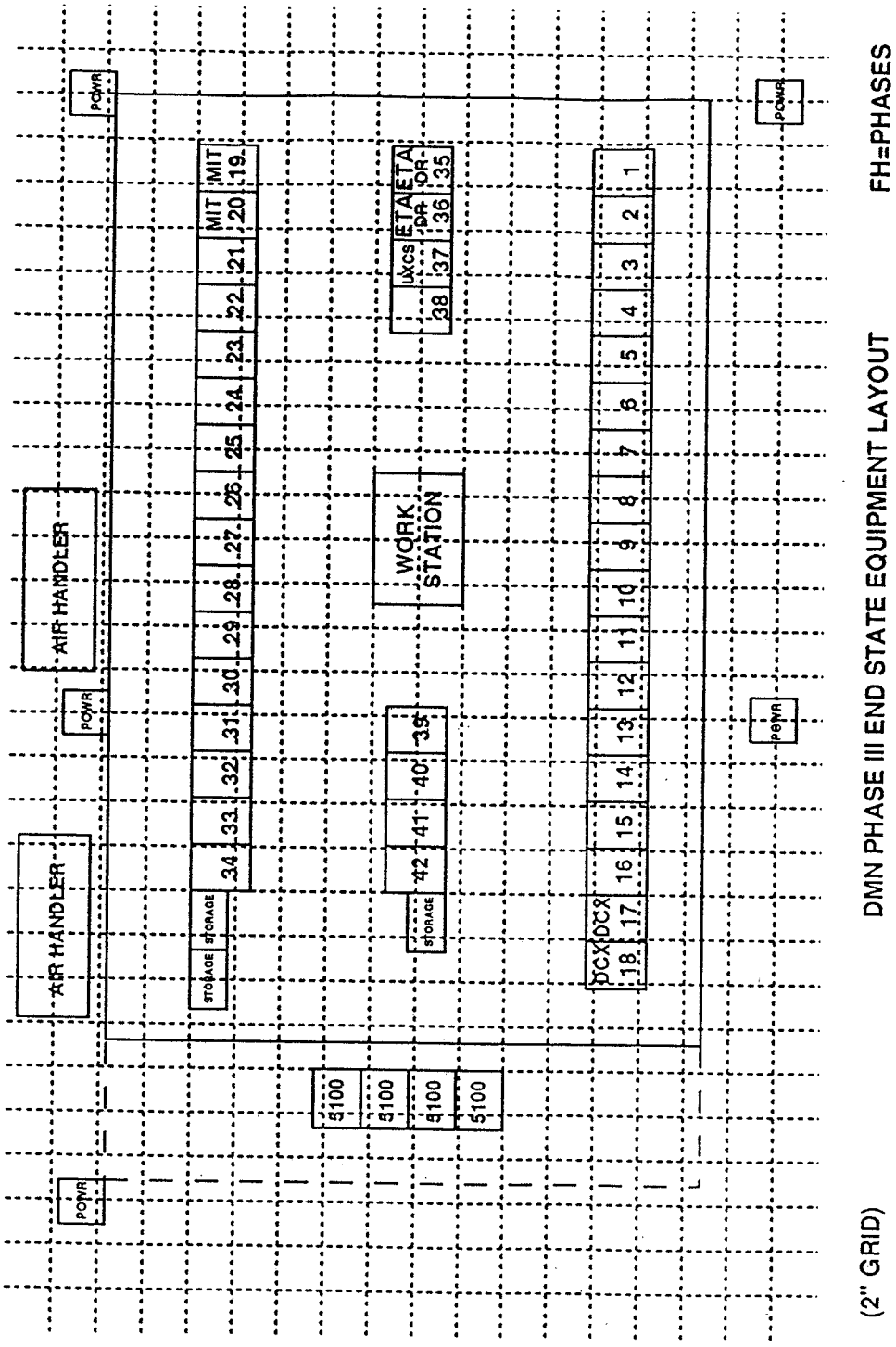


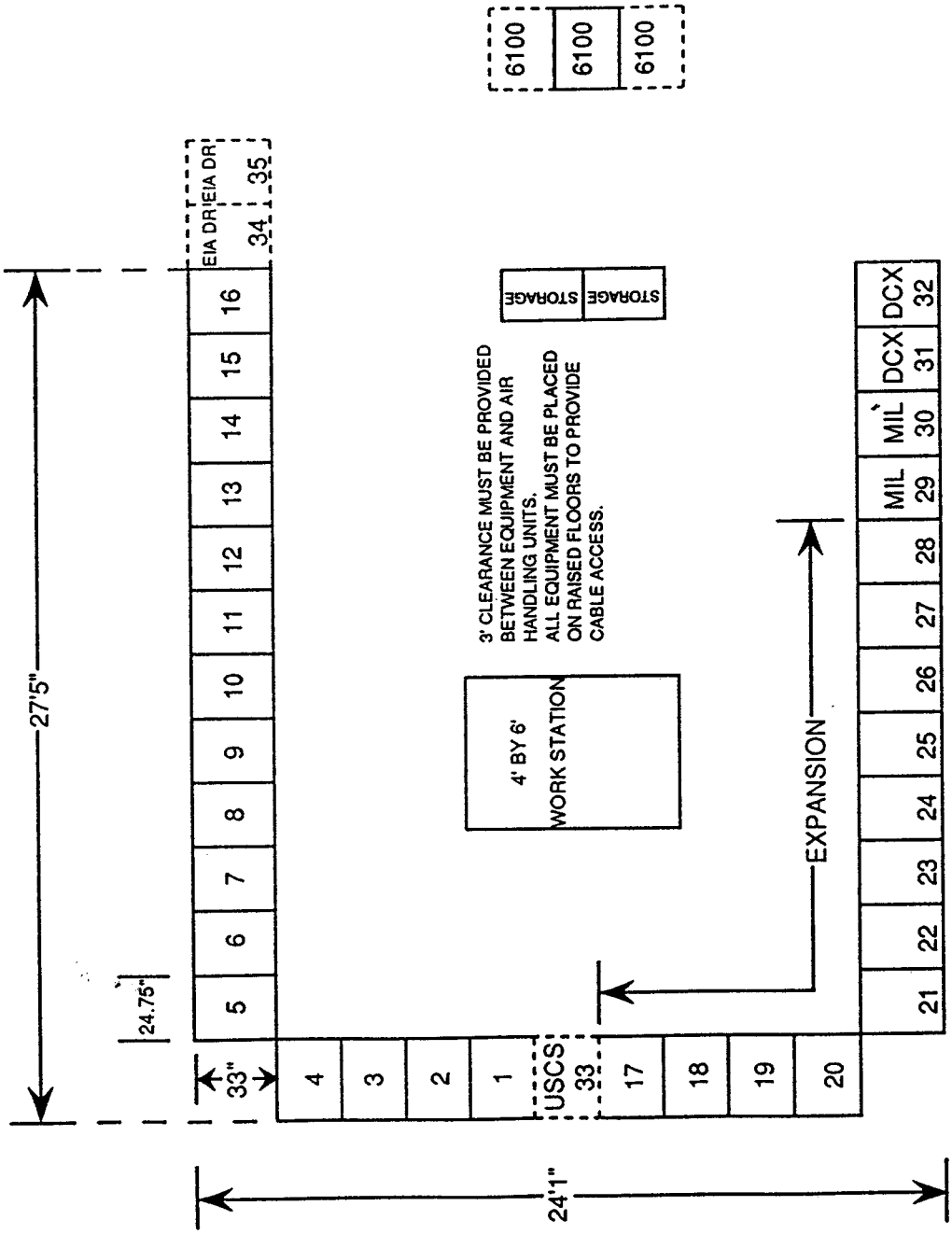
DMN ARTCC AR-4 AND AR-5 RACK CONFIGURATIONS



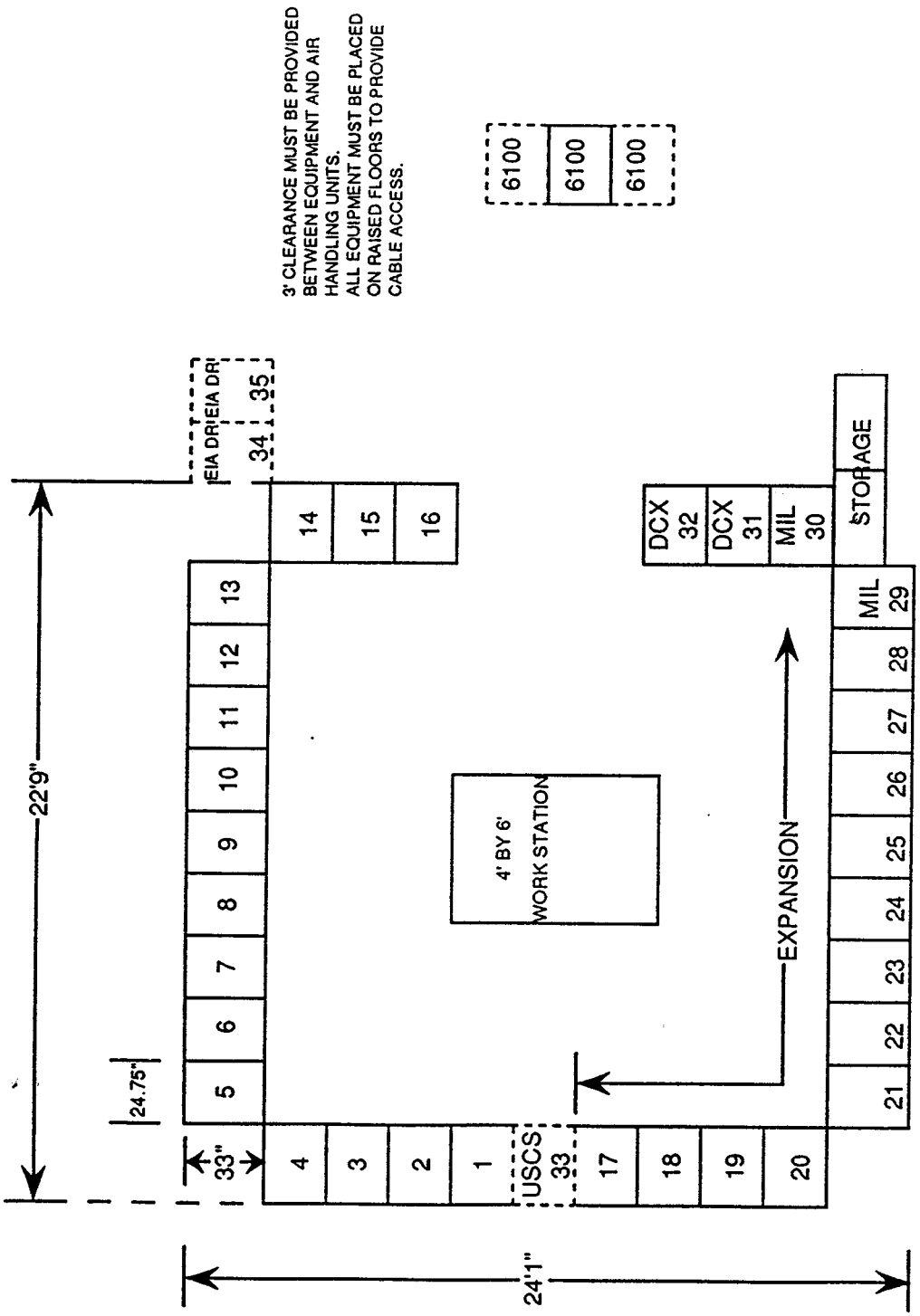
DMN ARTCC AR-6 AND AR-7 RACK CONFIGURATIONS

APPENDIX 4. ARTCC FLOOR PLANS





ALTERNATE DMN FLOOR PLAN



ALTERNATE DMN FLOOR PLAN